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The Elementary Level Food and Fitness Curriculum of the Louisiana Cooperative Extension Service: Program Effectiveness and Management (Nutrition Education).

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THE ELEMENTARY LEVEL FOOD AND FITNESS CURRICULUM OF THE
LOUISIANA COOPERATIVE EXTENSION SERVICE: PROGRAM
EFFECTIVENESS AND MANAGEMENT

The Louisiana State University and Agricultural and Mechanical Col.

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THE ELEMENTARY LEVEL FOOD AND FITNESS CURRICULUM
OF THE LOUISIANA COOPERATIVE EXTENSION SERVICE:
PROGRAM EFFECTIVENESS AND MANAGEMENT

A Dissertation

Submitted to the Graduate Faculty of
Louisiana State University and
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Doctor of Education

in

The Department of
Agricultural, Extension and International Education

by

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ABSTRACT

A study was conducted to evaluate the effectiveness of a food and fitness program implemented by Home Economists of the Cooperative Extension Service. The Fitness Factor program was taught by 49 classroom teachers to 1248 fifth grade students in 20 schools in nine Louisiana parishes. A secondary purpose was to identify and study program management factors that affect success of the program. Three sources of data collection were a) a youth pretest/posttest instrument measuring food and fitness practices and attitudes, and food consumption, b) a classroom teacher questionnaire and c) a Home Economist questionnaire. Ten hypotheses were tested. The following statistical tests were used to analyze data: t-test, analysis of variance, the Scheffé procedure and multiple regression.

The program effort affected positive changes between pretest and posttest in youth's food and fitness practices and attitudes, but not food consumption. The positive change in practices was statistically significant. A negative change in 24-hour food consumption was also statistically significant. Actual food consumption of youth may be more difficult to improve due to parental influence and food availability factors. A need to extend

educational efforts to parents (food providers of children) is thus indicated.

There were statistically significant differences among parish groups of youth participants in the study, indicating that some students benefited more from the program than others. Further studies are indicated to elucidate reasons for differences in group response.

Thirteen moderator or predictor variables were identified and studied for possible effect on student outcome. These factors related to coverage of lesson concepts, parental involvement, cooperative efforts between Extension and school personnel, teacher training methods and selected characteristics. Significant predictors of student practice change were teacher training methods and confidence level of teachers. Significant predictors of student attitude change were a high level of parental involvement and confidence level of teachers.

Findings of the study indicate that the Fitness Factor program can be successfully implemented in a school setting with the expectation that student behavior will change. Project implications for future program operations were offered based on findings from the study.

CHAPTER I

INTRODUCTION

Many attempts at nutrition education for youth have been documented in this century. These programs have been conducted by public agencies, including the Cooperative Extension Service and Food and Nutrition Service of the United States Department of Agriculture (USDA), and private organizations. Lack of coordination between agencies has been a major shortcoming of public agency sponsored programs. Lack of evidence of behavioral change (impact) of youth participants has also been a concern for all nutrition educators. The Fitness Factor program is a program developed to specifically address these two concerns.

"The Fitness Factor" program is a comprehensive food and fitness program developed by the Louisiana Cooperative Extension Service under a grant from Science and Education Administration (SEA)-Extension, 1980-82. The program was developed by Extension in cooperation with USDA's Food and Nutrition Service and the Union Parish school system. The program is structured to be implemented in the school setting with cooperation from Food and Nutrition and its Nutrition Education and Training (NET) Program. The program was piloted with fifth graders in Union Parish in

1982 by the 4-H Home Economist and school personnel and was found to be effective in bringing about nutrition behavioral change in students and parents. The curriculum materials were revised after initial evaluation and are now available for use in programming by Extension Home Economists. The program includes six units of 30 lessons and a parent involvement component. An important strength of the program is the use of the 4-H nutrition project manual, Fit It All Together, as a workbook.

The Food and Nutrition Service's NET Program has lost much funding in the past few years. Efforts made by this program to further nutrition education with youth in schools are diminishing, while interest and emphasis are still high. An excellent opportunity exists for Extension to provide a nutrition education program which will continue these efforts, while at the same time increasing the visibility of Extension and 4-H with school personnel, students and parents. The Fitness Factor program is a method to reach a very important Extension audience, children and their parents who may or may not be reached by traditional 4-H programs. The program should also increase cooperation between local school personnel and Extension.

The Problem

The revised Fitness Factor program was implemented in a second pilot effort in nine parishes in Louisiana in the

1983-84 school year. The problem was a lack of knowledge of the effectiveness of the revised program in bringing about nutrition behavioral change in youth. Therefore, this study was conducted to evaluate the effectiveness of the program in changing the nutrition behavior of youth. A related problem was lack of knowledge of program management factors that may have affected the success of the program. Therefore, a further purpose of the study was to identify factors relating to program management that may have affected the success of the program. Findings from the study may be of help in making recommendations to Extension agents who use the program in the future.

CHAPTER II

THEORETICAL FRAMEWORK

Included in the theoretical framework chapter are two sections. The first section is a review of current literature related to the study of the nutrition education program, the Fitness Factor. The second section is the proposed research model for the study and the proposed hypotheses.

Review of Literature

Nutrition education has existed in many forms for both adults and youth and has been attempted by many agencies and organizations in this century in the United States. One problem with nutrition education programs has been that even though they may have increased nutrition knowledge, they have failed to motivate recipients to make wise food choices and develop proper dietary habits. Also, a lack of coordination among government agencies, community organizations and school disciplines attempting nutrition education has resulted in a duplication of efforts and overall lack of organization (American Dietetic Association, 1973). More recent efforts at evaluating nutrition education programs have considered these problems and have attempted to provide information that will contribute to subsequent nutrition education

programs. This review includes information on the history of nutrition education programs for youth in the United States, an organizing framework for studying nutrition education programs, findings of research on factors affecting the success of nutrition education programs, evaluation of nutrition education programs and management of nutrition programs. Also included is a summary of the pilot effort for the educational program used in this study, "The Fitness Factor."

Nutrition Education for Youth

Nutrition in the Schools

Nutrition for youth in the schools has been a function of the child nutrition programs of the United States Department of Agriculture (USDA) since the passage of the School Lunch Act in 1946. This program has the dual goal of providing nutritious meals for children and of teaching children good eating habits (Luck, 1979). In 1969, the White House Conference on Food, Nutrition and Health recommended that "a comprehensive and sequential program of nutrition education be included as an integral part of the curriculum of every school in the United States and its territories" (St. Pierre and Rezmovic, 1982, p. 24). In 1970, Public Law 91-248 amended the School Lunch Act to allow USDA to spend up to one percent of the child nutrition program funds to supplement the nutritional benefits of these programs through nutritional training and

education. In 1975, section 18 of the Child Nutrition Act authorized USDA to make special funds available to state educational agencies for conducting nutrition activities to teach children the nutritional value of foods and its relationship to health. Section 19 of the Child Nutrition Act (Public Law 95-166), in November, 1977, authorized USDA to formulate and carry out a nutrition education and information program through grants to state education agencies. The administrative program for these funds, the Nutrition Education and Training (NET) Program, was established by the Secretary of Agriculture to function under the Food and Nutrition Service of USDA (Singleton and Leonard, 1980).

Luck (1979) says that primary goals of the NET Program were to provide children with opportunities to learn about food and nutrition and its relationship to health, and the experiences to use this knowledge to develop food and nutrition attitudes and practices that would lead to healthy lifestyles. The NET Program provides for resources for training food service personnel and the opportunities for food service workers and teachers to receive instruction in nutrition and methods of teaching nutrition to youth.

In Louisiana, the NET Program was implemented in several ways (Louisiana Department of Education, Division of Auxiliary Programs, Food and Nutrition Services). One

means was projects conducted by the State Department of Education, such as the development of training materials for food service personnel, and establishment of a resource library of nutrition education and food service training materials. The State Department also contracted with local school systems, sponsoring agencies, colleges and universities and nonprofit private agencies to implement various parts of the Program. The Dairy and Food Nutrition Council of the Southeast, Deep South Division contracted with the NET Program to train food service workers and teachers in the use of a program entitled "Food Your Choice" in a large majority of parishes. Other parishes contracted to conduct their own programs including development of nutrition activities to be integrated into the school curriculum, use of the cafeteria as a learning laboratory, and purchase of nutrition resources.

In 1979, a major step was made toward inclusion of nutrition as a vital part of the school curriculum. Louisiana Act 750 (1979), concerning competency based education, provided for the inclusion of nutrition concepts in health, science and social studies curriculums for all grades. As a project of the Louisiana NET Program, competencies were developed for each grade level. Eventually, competency tests developed for these disciplines are expected to cover nutrition concepts.

In 1979, 1980 and 1981, surveys were conducted of teachers, principals and students throughout Louisiana to determine their assessment of the need for nutrition education. This procedure was required as a prerequisite to funding under Public Law 95-166 (Singleton and Leonard, 1980). Results of this study will be reported elsewhere in this review.

Nutrition Education Concerns

Despite overall progress toward nutrition education for youth, several concerns have been reported (Current Concerns, 1979). While many nutrition education programs may have increased nutrition knowledge, they have failed to motivate recipients to make wise food choices and develop proper dietary habits. Also, an apparent lack of coordination between persons in government agencies, community organizations and school disciplines attempting to disseminate nutrition information has resulted in a duplication of efforts and overall lack of organization. Another shortcoming is the lack of parental participation. Maretzki (1979) points out the fact that very little comprehensive curriculum development or educational systems planning was initially undertaken with NET funds.

Nutrition Programs of the Cooperative Extension Service

The Cooperative Extension Service has actively been involved in informal nutrition education programs since

1914 and has more recently initiated a comprehensive nutrition program for low-income adults and youth called the Expanded Food and Nutrition Education Program (EFNEP). The Extension Service also has had, as a part of its 4-H youth program, a foods and nutrition project which teaches youth by self-study materials and informally in groups organized outside the school classroom. In addition, in Louisiana, a strong link with school systems exists as the 4-H club program is organized largely in the school. Louisiana has also developed strong interagency networks of cooperation among nutrition-related organizations.

The Fitness Factor Program. As a public educational institution concerned with nutrition education and community involvement, Extension Food and Nutrition Service administrators have expressed the belief that more effective behavioral change occurs when collaboration occurs so that all programs focusing on children's food habits are coordinated and supportive of such efforts. For these reasons, in 1980, the Louisiana Cooperative Extension Service contracted with the Science and Education Administration (SEA)-Extension, USDA, to develop and implement an educational program to teach parents of children taught in school through the NET Program in Louisiana. Two primary purposes of the study (Gentry, 1982) were to demonstrate the cooperative efforts of two agencies, Cooperative Extension and Food and Nutrition

Service's NET Program, working toward the overall goal "to improve the eating practices of children and youth," and to show that parental involvement in nutrition education would increase the effectiveness of the program effort.

The program called "The Fitness Factor" was piloted with fifth graders in Union Parish in 1982 by the 4-H Home Economist and school personnel. The program concepts were based on the nutrition competencies of Louisiana's Competency Based Education Program for Grade 5. Also included as a primary resource in the program was the 4-H Foods-Nutrition project manual Fit It All Together. The pilot study tested the effects of a parent education component of the nutrition education curriculum on the food and fitness behavior of both parents and youth involved in the program.

Gentry reports that the program was effective in bringing about behavioral change in students. In the study, both a control group and an experimental group received the nutrition education component in the classroom taught by classroom teachers. In addition, the experimental group received a parent education component. Students in both experimental and control groups showed a positive change in nutrition behavior after the program as measured by differences between a pretest and posttest. However, the implementation of a parent involvement component did effect a greater degree of behavioral change

in nutrition practices and attitudes of youth participants in the experimental group than the control group. In comparing results of a 24-hour food intake record, examination of snacking behavior also showed a greater improvement in the experimental group. The experimental group showed a greater decrease in the consumption of foods from the Fats and Sweets food category than the control group. There was also a greater degree of behavioral change in adults in the experimental group than the control group concerning the availability of selected food items at home. This is an important finding since parents are the primary food providers of children. The success of the parent involvement component was further demonstrated by family members' attendance at the family events and the teachers' evaluation. The teachers recommended that parent education be included as an integral part of the education program.

An effective activity in the Fitness Factor program pilot involved the cooperation of food service personnel. Food service managers came into the classroom to explain the purpose of school lunch and to invite parents to experience a school lunch with their children. Participation in the school lunch exceeded expectations of school personnel and made a lasting impression on parents and school food service.

Gentry also reports that the cooperation between agencies in the project was effective. She gives the benefits of such an effort.

Cooperative efforts between two agencies working toward the overall goal "to improve the eating practices of children and youth" can effect a more comprehensive program effort and greater behavioral change. With reduction in funding of the NET Program, agencies such as the Cooperative Extension may be able to provide educational materials such as the ones developed for this project, and the support necessary to continue the nutrition education that was started through the NET effort. Extension's informal parent involvement component may provide the support from parents for the inclusion in school curriculums of such a program. (p. 37)

Teachers in the pilot project were positive about their involvement in the nutrition education effort, although some had either negative or indifferent attitudes before and during the program. This was probably the result of inadequate instruction in use of the materials, insufficient time, and lack of feeling of importance of nutrition education. However, after the program most teachers had shared the program with other teachers in school and were eager to receive and use copies of the revised program materials. They felt that the program was successful in generating student interest and parental involvement. They felt that such a packaged program would be appropriate for use as a separate unit in the science or health class periods. The teachers also recommended the parent component be included in the revision and that

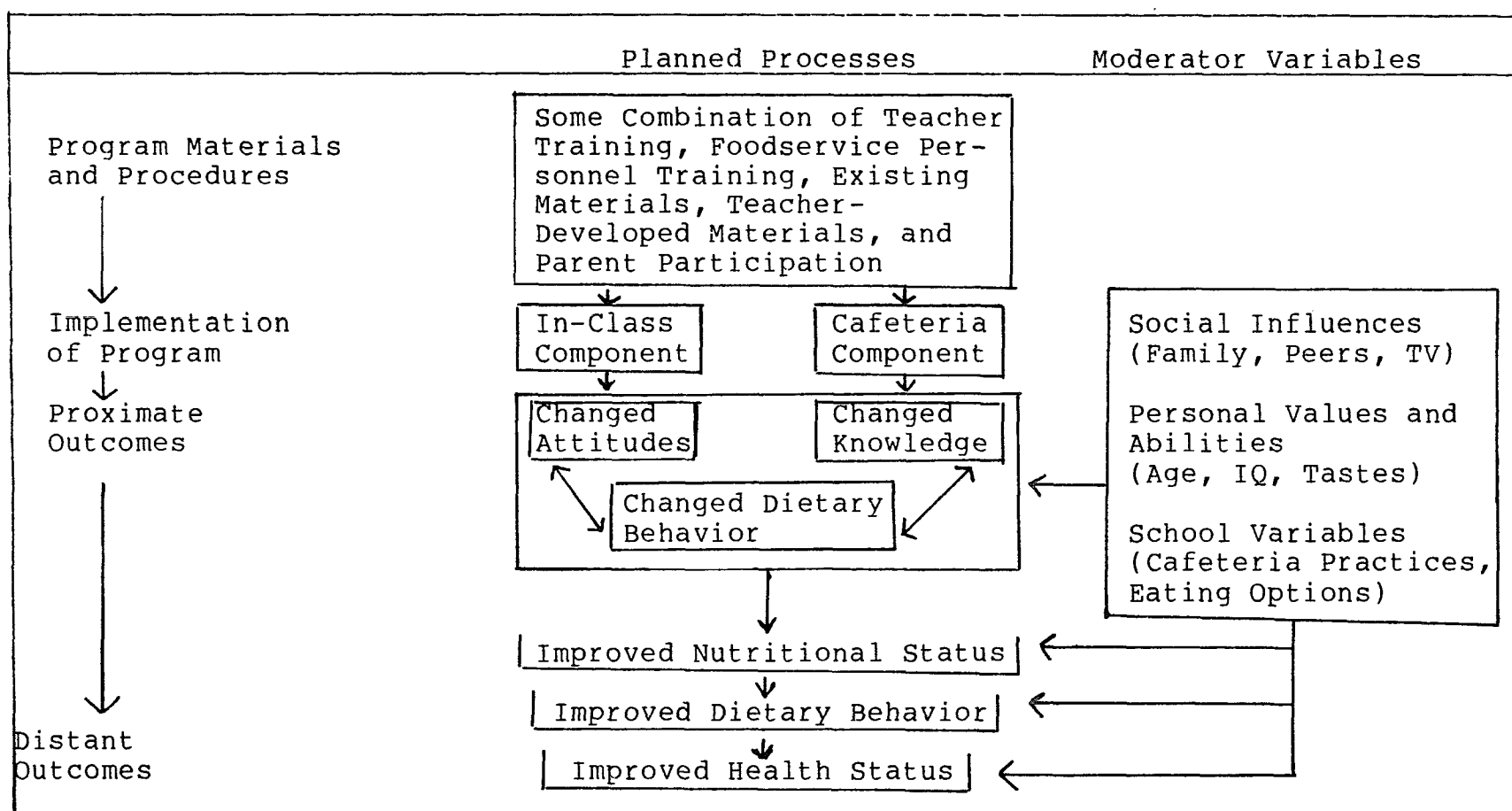
more detailed step-by-step teaching instructions should be a part of the revised program.

Following the pilot study, The Fitness Factor program was revised based on findings and evaluation of teachers. The revised Fitness Factor curriculum is an activity-oriented curriculum of 30 lessons with an emphasis on making wise food and fitness choices. Methods of parent involvement include a series of parent newsletters, an invitation to parents to attend a school lunch with their children, a parent-student workbook, family homework assignments and a family food and fitness activity to be held at the completion of the six or nine-week program. It suggests strong coordination of efforts between teachers, administrators, parents and Extension Service personnel. The suggested program evaluation is designed to measure food attitudes and behavior changes of youth involved in the program.

An Organizing Framework for Nutrition Education

The ultimate goal of any nutrition education effort is to improve the nutritional status of the population by promoting the adoption of good dietary habits. However, many factors intervene and have effects on the outcome of nutrition education programs, especially in-school programs. St. Pierre and Rezmovic (1982) have developed an organizing framework to describe the components (see Figure 1). Such a model can be useful in planning, implementing and evaluating nutrition education programs.

Figure 1. Organizing Framework of Nutrition Program Activities and Outcomes.



Note: From "An Overview of the National Nutrition Education and Training Program," by R. G. St. Pierre and V. Rezmovic, 1982, Journal of Nutrition Education, 14, p. 62.

The framework suggests the hypothesis that program implementation impacts on children's nutrition-related attitudes, beliefs, values, knowledge and dietary habits/behavior. This model treats these aspects as interactive, not causal. Positive changes in these conditions lead to improved nutritional status and health status.

Included in the framework are the planned processes of program implementation including curricula and other teaching materials, training of teachers and food service personnel, and parent participation. The program usually involves a classroom component and sometimes the cafeteria. For this project, an additional planned process, cooperative efforts of agencies, would be added to this component. This would include the support and classroom participation of Cooperative Extension personnel.

The importance of moderator variables that codetermine process and outcome variables is recognized in the model. These include social influences such as family, peers, television, friends and a set of variables related to attributes and values of the child. School variables include the availability and price of snack foods at school, the number of children eating school lunch and the percentage of students who receive free or partially paid lunches.

Application of the framework is possible if the program is based on cognitive oriented theory or on social-environmental oriented theory. The framework also indicates a more recent approach to evaluation that is realistically based on program implementation, proximate and distant outcomes.

Factors Affecting Children's Dietary Habits

Nutrition education early in life is of prime importance because the eating habits of school-age children are more easily influenced during elementary years than at any other time of life (Smith and Justice, 1979). Factors influencing eating habits of children include nutrition knowledge and attitudes, preferences developed in the home, the school and the wider social environment. The relationships among these factors need to be considered in planning appropriate activities for nutrition education programs, and in evaluating processes and outcomes (Yperman and Veermeersch, 1979).

Nutrition Knowledge, Attitudes and Behavior

While nutrition education efforts have attempted to promote positive changes in students' knowledge, attitudes and behavior, a cognitive orientation based on nutrition knowledge alone has acquired a central position in the evaluation of nutrition programs (Yperman and Veermeersch, 1979). There is much evidence in the literature

concerning the effects of different types of nutrition education programs on nutrition knowledge of youth; however, there are fewer reports of the effects on nutrition behavior.

In a nationwide evaluation of the impact of NET programs, St. Pierre and Rezmovic (1982) report positive findings on knowledge in each of six studies on elementary school students. An evaluation ("Food Your Choice," 1978) of the National Dairy Council's nutrition program "Food Your Choice, Levels 1, 2 and 3" revealed that the program significantly increased K-6 students' nutrition knowledge even when the effects of prior knowledge, maturation, site, sex and ability level were removed. Baker (1972) found that scores on a nutrition test were significantly higher for experimental classes of fourth and fifth graders receiving a three week nutrition program. However, no significant changes in diet due to the program were observed.

Results of nutrition education programs have also been reported for junior high and high school students, as well as elementary students. In a study (Head, 1974) on the effects of a five month nutrition education program for fifth, seventh and tenth graders, all fifth grade classes and one seventh grade class significantly improved their knowledge of nutrition. Wodarski, Adelson, Todd and Wodarski (1980) report that the use of an activity-

oriented curriculum, "Teams-Games-Tournaments," demonstrated a significant improvement in nutrition knowledge of elementary and high school students.

In Louisiana, a comparison (Shoaf, Claybrook and Westergaard, 1979) of the nutrition knowledge scores between pretest and posttest of K-3 students whose teachers had received nutrition instruction showed significant increases in scores of the treatment group and significant differences between scores of the treatment and control groups.

Shapiro, Bale, Scardino and Cerna (1974) report the results of an evaluation of the Extension Service's Mulligan Stew television series. Produced in 1970-72, the series included six 30-minute television films designed for nine to 11 year olds. Participants could view the series at home or at school and were provided printed workbook materials to go with the series, including a comic book. The promotion and distribution of the series involved several agencies and groups. Evaluation of the series revealed that youth participants demonstrated more knowledge about nutrition, and were more likely to engage in nutrition-related activities. However, the program seemed to generate only minimal changes in nutrition behavior, with no discernible impact on the diets selected by children when given a free choice. The report also states that in-school viewing of the program generated

greater changes than at-home viewing. The program did raise youth's awareness of the concept of empty-calorie foods.

Head (1974) reports some improvement in behavior change of seventh graders through dietary intake data which showed that diets improved significantly after nutrition education. Plate waste from school lunch of fifth graders decreased and acceptability ratings of school-served food increased among fifth graders more than any other group. Fifth graders in both experimental and control groups had improved diets. The evaluation of the National NET Program by St. Pierre and Rezmovic (1982) found no strong evidence of program effectiveness in reported food habits and only one of the studies showed positive effects on food preference and willingness to select new foods. The evaluators suggest that the lack of behavior change versus knowledge change may be a result of the short-term nature of most nutrition programs. Teachers in the Dairy Council study ("Food Your Choice," 1978) did report incidents of children bringing more nutritious snacks to school, selecting nutritious snacks more often at parties and selecting and eating more nutritious foods at lunch. Furthermore, students who would not eat vegetables and fruits before the program ate them more often for school lunch after the program.

Of great importance are the findings of a recent study by McDonald, Brian and Esserman (1981) using consumer research methods to evaluate children who were or were not exposed to a nutrition education program. In-home interviews were conducted with 1,431 children and 812 mothers. Assessed were nutrition knowledge, attitudes and behavior.

Children exposed to the nutrition education program reported greater consumption of a number of desirable foods and nutrients, expressed more positive attitudes toward consumption of fruits and vegetables and displayed improved ability to apply nutrition knowledge in making food choices. These findings provide evidence that in-school nutrition education influences children's reported food behaviors outside the classroom. (p. 140)

This study also supports the belief that children themselves can be surveyed to determine the influence of nutrition education on food choices. Asher's study (1978) previously had shown that "young middle-class white children were able to recall the kinds and amounts of food eaten provided persons knowledgeable in foods and nutrition using appropriate food models interrogate them." (p. v)

Social Factors

Realizing the limits of nutrition knowledge in changing food behavior, nutrition educators have expressed a concern about the general lack of application of this knowledge (Poolton, 1972). The development of food habits

by children is affected by such socioeconomic factors as attitudes and preferences from the school, home and the wider social environment. Yperman and Veermeersch (1979) have identified three factors that are associated with food habits as food preferences, dietary complexity and school lunch participation. They further suggest that

Parental attitudes and social factors are the most important predictors of children's food preferences and dietary complexity. Employment status of the mother, the child's nutrition knowledge and perception of a friend's food preferences are related to school lunch participation. (p. 72)

Other factors offered by Baker (1972) as influencing children's food preferences include peers, siblings and television. When parents of fourth and fifth grade students involved in a nutrition education program were questioned concerning factors they felt were important in influencing their child's change of diet, the factors selected most often were "TV and radio advertisements" and "changes in school lunches and snacks." They did not select as a factor a set of recommendations sent to parents concerning their children's diets.

When examining the effects and interrelationships of the variables of dietary complexity, food preferences and school lunch participation on the food behavior of youth, Yperman and Veermeersch (1979) found several important findings and implications for nutrition educators. Parental factors have a prominent role in determining

dietary complexity for children, and dietary complexity has been shown to contribute to a more adequate diet. Children of mothers with higher education and more positive attitudes about nutrition have more complex diets. Nutrition knowledge also had a more positive relationship with diet complexity scores. These relationships support the logic that "children are better able to retain nutrition knowledge gained at school when it is reinforced by conditions in the home that are favorable to good nutrition practices." In relation to food preferences it was found that the school lunch program is not modifying children's preferences for fast foods. The investigators believe that this fact represents a special and difficult challenge for nutrition educators and recommend that young children be encouraged to select alternative menus instead of eliminating fast foods entirely. Also, teaching knowledge of food groups is not likely to be effective in promoting good choices. Potentially more effective methods of influencing children's food preferences lie in education targeted at parents and classroom experiences that recognize that food attitudes are influenced by friends.

Parental attitudes were found to condition the child's familiarity with a variety of foods and was the most important variable in conditioning the child's acceptance of new foods at school (Yperman and Veermeersch,

1979). However, many parents are not acquainted with their children's food preferences and may need assistance in understanding how to supplement their children's menus and expand food experiences for their children at home.

Cormier (1971) reports that elementary school students in Beauregard Parish, Louisiana, had significantly more milk and less "junk" food when eating at school than when at home during the summer vacation. This study supports the proposition of Baker (1972) that parents, who should be most concerned about their children's diets, do not necessarily feed them properly.

A study conducted more recently to determine the relationship between children's food preferences and those of their parents showed surprising results. Birch (1980) concludes that neither mothers' nor fathers' preferences are significantly related to those of their children, but that a commonality of food preference may exist within a subcultural group. He does, however, agree that parental preferences may limit the set of available foods in the home. Indications relating to influences of peers on food choices (Yperman and Veermeersch, 1979) suggest that the popularity of certain foods may more nearly be related to a child's social needs than to likes and dislikes. Also, boys may be more susceptible to peer pressures than girls.

Recognizing the importance of parental attitudes and influence, a few efforts have been made to include parents

in a specially prepared nutrition education program. In a program for third graders and their parents (Smith and Justice, 1979), students in a group with parent involvement showed a trend toward better acceptance of vegetables than those in a control group, and also had better participation in the school lunch program, although the differences between groups were not significant. Parents reacted favorably to the nutrition program in that they enjoyed receiving the information sent to them in parent newsletters. Parents were also invited to visit a satellite school lunch kitchen and have lunch with their children one day during the treatment period.

Teachers in a nutrition education program at three grade levels (Head, 1974) identified lack of reinforcement of concepts in the home as a limitation in nutrition project activities. Although an effort was made to reach parents, such as trying to get parents to attend PTA meetings, no school in the study reported success. Some comments were received from parents, however, concerning recognition of project activities, some interest and limited reinforcement at home. Both teachers and the principal in one school, however, believed that intra-family relationships had improved in many cases through the children's interest in helping with food buying and preparation at home.

In another study (Kirks, Hendricks and Wyse, 1982) a newsletter was the vehicle for providing nutrition education for parents of students in grades K-3. At the end of a four month treatment period, 24-hour food recalls revealed that parents who participated in nutrition education reported that their children were consuming a higher quality diet and a wider variety of foods than students in the control groups. Since parent involvement did not seem to have a significant effect on student knowledge at all grade levels or on students' nutrition attitudes, it appears that improved eating behavior in the home may be an important outcome of including parent education in a nutrition effort. The authors recommend that a parent component be included in nutrition education curricula. Tobik and Torrisi (1979) reported on the impact of a family food fair in increasing the awareness of good nutrition and in exposing youth and adults to new food experiences.

Curriculum and Teaching Materials

Well-designed curriculum guides are critical to the success of nutrition education efforts. Cooper and Go (1976) identify factors built into instructional materials that influence learner success. The basic components of a guide include concepts, objectives, learning activities and evaluation procedures, as well as organizational format and emphasis on social concerns. The authors

stress the need to use socially relevant nutrition concepts, to examine these in terms of objectives defining specific skills to be demonstrated, and to design learning experiences offering students the opportunity to practice skills. Evaluative procedures are important with the current emphasis on teacher accountability. Furthermore, to effectively convince school administrators of the role of nutrition education in an already overcrowded curriculum, programs must have accurate indication of expected outcomes. Several organizational factors to be considered include the provision of background nutrition information and a clear explanation of teaching materials. These will help increase the probability of effective implementation. As an organizational factor, a clearly presented teaching guide can influence positive outcomes. Under the heading of social concerns, the authors stress the inclusion of current nutrition issues and the integration of socioeconomic and cultural values into lesson activities.

Poolton (1972) discusses teaching strategies which offer the greatest potential for long-range application of nutrition knowledge. She stresses the importance of activities that have the element of discovery, interest and meaning to the student. For example, participation in problem-solving activities related to an individual's

needs and concerns will create interest and lead to acquisition of facts that can be used to solve the problem. This gives meaning or purpose to the learning. This process can also be called a discovery and application learning process. The importance of the student making choices is also discussed by the author who suggests that responsible choice-making by the individual, based on adequate knowledge should be the goal in teaching.

Closely related to discovery learning is a method of instruction developed through research on games as devices, on small groups as classroom units and on the task and reward structures of the classroom (Wodarski, Adelson, Todd and Wodarski, 1980). This method of behavioral analysis, the Teams-Games-Tournament (TGT), was successfully used as a nutrition unit for elementary and secondary students. Students in the study significantly increased in nutrition knowledge, enjoyed working in groups and competing, learned a lot about nutrition, and felt that what they learned would influence their future food choices. In addition, the authors believe that TGT's carefully structured sequence of activities makes it possible for teachers with no prior experience to implement a successful program.

The Ontario Milk Marketing Board has reported successful use of a teaching guide which stresses an activity-oriented approach (Cooper and Philip, 1974).

They suggest that many teachers do not know how to deal with nutrition as a subject, finding it either too complex to simplify or lacking the ideas and activities to make it interesting.

Findings and implications from a needs assessment (Singleton and Rhoads, 1981) for nutrition education of Louisiana students suggest implications for program content and learning experiences that should be considered in nutrition education programs for Louisiana youth. Relevant summary statements from the project report follow:

Students recognize the importance of studying nutrition at school.

Even though many students are not learning about nutrition in school during the current year, they are obtaining information about this science from watching television and from interacting with people in their home.

Nutrition is integrated into other subjects more than it is taught as a separate subject, and health or physical education is the major curriculum source for this science.

The more activities and sources that students used to learn about nutrition, the more knowledgeable they are about this science.

Breakfast is the meal most frequently omitted; reasons given most often by students are: "not hungry" or "no time."

Students do snack. The time of day most snacks are consumed is in the afternoon, and the older students snack more than the younger ones do. Approximately half of the sample purchase snacks at school.

The majority of students do not consume a food rich in vitamin C daily nor a food rich in vitamin A every other day.

Many students take a vitamin supplement.

Students fail to apply their knowledge of nutrition to their own food selections.

Parents have a great influence on their children's eating habits; therefore, they need reliable nutrition information.

Teachers and Teacher Training

A number of studies report the importance of attitude and competency of teachers on the effectiveness of the in-school nutrition program. Head (1974) found that when an individual teacher was committed to nutrition, there was more success than there was in classes in which the teacher felt forced into teaching nutrition. Chetnik (1974) reports that the way a teacher views his or her ability to teach the subject often influences the curriculum. Teachers may not know where to begin and do not want to spend considerable time developing a unit. They often feel inadequately prepared if they have not had nutrition instruction. In a program implemented by the Cooperative Extension Service in Michigan community schools, Chetnik reports success with community volunteers teaching teachers in the classroom with students. This suggests the advantage of teachers experiencing project activities themselves. Chetnik also expresses the belief that children's respect for good nutrition is stimulated

by the teacher's enthusiasm and commitment to the program. Two studies (O'Connell, Shannon and Sims, 1981) concerning the nutrition-related attitudes and beliefs of teachers found that although teachers have a favorable attitude toward nutrition education in the schools, this may not necessarily be accompanied by a strong commitment to, or interest in, teaching nutrition. Actual experience in teaching nutrition may result in teachers being more favorable toward its inclusion in schools.

Maretzki (1979) expresses the need to address "the question of how to teach as an integral part of what is to be learned and why it should be taught." The way teachers are taught will influence their attitudes toward the subject and how they will teach it. She lists barriers to implementation of nutrition education as: teachers may derive little more than personal satisfaction from including nutrition and may give it low priority in relation to other basic academic skills; teachers often do not believe their efforts will lead to long-term effects on children's health; teachers see little relevance to children's actual food behavior in nutrition objectives and activities; and teachers often lack self-confidence and enthusiasm for nutrition education because they view nutrition as a college-level subject.

Much emphasis has been placed on the instruction of teachers in principles of nutrition education. This

supposedly would lead to effective nutrition education in the schools. However, all studies relating to the effects of instruction for teachers do not agree on method or content of instruction. Some teachers and food service personnel have had increased nutrition knowledge and a more positive attitude about their role in nutrition education following a nutrition course (Shoaf, Claybrook and Westergaard, 1979). The need for formal teacher nutrition education may not be necessary to achieve the desired outcomes. In an evaluation (Shannon, Bell, Marback, O'Connell, Graves and Nicely, 1981) of three levels of instruction for teachers for elementary schools, the provision of an inservice or formal course as additional teacher preparation did not promote consistent improvement in outcome. Failure of the supplemental teacher preparation to effect better student outcome in this study was attributed to the adequacy of the curriculum materials in providing good instruction. Also, with the successful TGT method, teachers required no prior experience in the teaching method or program (Wodarski, Adelson, Todd and Wodarski, 1980).

For those employing teacher training, successful methods of training teachers of elementary school children have been reported which emphasize short, practical classroom exercises and concept translation (Farnsworth, 1981). Course content focused closely to the level of

students, and activities that involve games or the investigation-inquiry approach were found to be most useful. Instructions on how to abridge or segment a course were requested by participants to be included in the course. Other findings point to the more effective use of inservice rather than preservice instruction (Rye, Hunt, Nicely, Shannon, 1982). Cortes and Standal (1973) emphasize the importance of providing teachers with tools they need to teach nutrition to children and communications to encourage teachers to apply nutrition information in their daily lives. They further recognize the important position of authority that teachers hold in the eyes of children as an important resource to be tapped to enhance nutrition education. They also encourage continuing communications between teachers and nutrition professionals.

Other guidelines for inservice training for elementary teachers are offered by Callahan (1973), the project director of nutrition education in Massachusetts. She believes that with the overcrowded curricula in school systems today, promoting interest in nutrition education takes sales technique. Workshops for teaching nutrition to teachers are fostered through direct contact with the school administrator, curriculum coordinator, health educator, school nurse or school food service supervisor. Interest may also be stimulated through short promotional

programs to professional groups with use of visuals when possible. Information regarding resource agencies is also helpful. Workshops are more readily accepted when scheduled on release time rather than in late afternoon. Size of class should be limited to 15 to help create a warm relaxed atmosphere that will improve teacher receptivity. Action-oriented workshops with no wasted time will reduce teacher restlessness. Activity sheets with step-by-step procedures are suggested as is correlation of classroom activities with the school food service program. Also, trainees may want to participate in actual classroom teaching to be supportive of the teacher.

A needs assessment of teachers in Louisiana revealed important conclusions and recommendations for working with teachers in nutrition education efforts (Singleton, Leonard and Garland, 1980).

Teachers' attitudes were positive toward nutrition; however, teachers in public schools and in grades K-6 held a more positive attitude than their counterparts.

Teachers integrated nutrition into other subjects more so than they taught it as a separate subject, and most often it was integrated into the health and physical education courses.

Current information on key nutrition issues and resource materials were the factors named by teachers as those most needed to help them teach nutrition effectively.

Popular magazines were the primary resource used by teachers in this sample to acquire nutrition information.

The resource used most frequently to teach nutrition was a self-developed curriculum guide.

Discussion was the most popular teaching method used by teachers for nutrition instruction followed next by posters, demonstrations, and lectures.

Preferred audio-visual aids for teaching nutrition are films and filmstrips with cassettes.

Lack of communication and information were reported as reasons for failing to use food commodities, school lunchroom facilities, and/or the school food service managers in teaching nutrition.

Prevalent diet-related problems of students observed by teachers were related to teeth, weight, energy, and skin.

One-fifth of the teachers responded that they were not willing to take any kind of instruction in nutrition and of those who were willing to attend, inservice workshops was the preferred method to obtain nutrition knowledge.

School Administration

Deatricks and Sorg (1982) believe that the approval and support of school administrators is of prime importance to the success of a nutrition education program, as it is to any program that has voluntary participation. Support of certain groups at the local and state levels is necessary for the success of any school-based program. The support groups must be managed so that each group is reached as it becomes important in the establishment or continuation of a local program. A key to motivating support is understanding beliefs, attitudes and knowledge of the groups concerning the proposed program. In their

study where one group of teachers received school board reinforcement as opposed to those who did not, teachers who had received Board Endorsement covered course objectives to a greater extent both in breadth and depth than those who did not, and their students had achieved higher scores.

In an attempt to identify factors relating to adoption, implementation and integration of school based programs, the Maine Department of Human Services (Deatrick and Sorg, 1982) recommends that when approaching the school superintendent, one should first make him/her aware of the problem at hand and offer information as to how the proposed program can solve the problem. The agency proposes a five step strategy: (1) increase awareness of the problem, (2) increase awareness of availability of funds for the program, (3) enhance the perception of the school as an appropriate setting for the program, (4) reinforce the belief that schools can help combat the problem and (5) reduce uncertainty about various methods of providing the solution to the problem.

In a study of the attitudes of school administrators in three north Louisiana parishes receiving a nutrition program, Shoaf, Claybrook and Westergaard (1979) found negative attitudes toward nutrition education, even after teachers and food service personnel were trained in nutrition. Reasons offered were: (1) inadequate notice of

project activities, (2) a general lack of interest regarding nutrition education, (3) lack of personal contact from project staff and (4) lack of general publicity and advance notice of the program.

A needs assessment of nutrition education in Louisiana by principals revealed the following important conclusions and implications for future nutrition education efforts in Louisiana (Singleton and Leonard, 1980):

Principals' attitudes concerning nutrition were positive.

About two-thirds of the principals were in favor of offering nutrition instruction at every grade level; one-fifth responded that it should be offered in grades K-6 only.

Nutrition was being taught in nearly all of schools under the administration of the principals.

Principals reported the following factors which could help teachers to teach nutrition: availability of materials, current information on key nutrition issues, and funds for projects and materials.

The focus of this inservice training in nutrition for teachers should be on nutrition content for specific grade levels.

Principals need the aid and encouragement of higher level administrators within their school system to encourage additional instruction in nutrition.

Principals can control the type of snacks which are available to students within the schools.
(p. 70-72)

School Food Service Personnel

Efforts have been made to include the interaction of school food service personnel and teachers in the

nutrition education process with use of the school cafeteria encouraged as a learning laboratory. In a program conducted for fourth graders with six lessons focusing on the school lunch program, an increase in the percentage of students drinking milk for lunch was a discernible behavior change. The researchers, Smith and James (1979), served as a resource team for the teachers and food service personnel in this study.

One goal of nutrition education programs has been to increase school lunch participation. Perkins, Roach and Vaden (1980) found a significant relationship between teachers' perceived view of food quality and student participation. In their study, upper-elementary teachers seemed to have more negative attitudes toward school lunch than lower-level teachers. The researchers believe that identifying teachers' attitudes toward the school lunch program and nutrition education can assist in the development of nutrition education programs. This may imply more cooperative efforts between teachers and school food service.

There is a need for greater cooperation and use of the school lunch program in nutrition education. A needs assessment of students in Louisiana reports that the "school lunch program does have a positive effect on students' eating habits; but its scope could be broadened by additional nutrition activities" (Singleton and

Rhoads, 1981, p. 71). Teachers in a similar study (Singleton, Leonard and Garland, 1980) reported that lack of communication and information were reported as reasons for failing to use food commodities, school lunchroom facilities, and/or school food service managers in teaching nutrition. Teachers and principals both reported that they were not knowledgeable of the resource person in the school system designated to be responsible for nutrition education (Singleton, Leonard and Garland, 1980; Singleton and Leonard, 1980).

As early as 1963-64 total school involvement was an approach to a nutrition program in a Michigan community (Lavigne and Siegal, 1965). School administrators, personnel from the science, physical education, health, art and library science areas, professional and lay kitchen help and student councils cooperated to produce an effective program that showed a reduction in food waste, more communication between students and food service, and cooperation and interest of all. A health consultant functioned as coordinator of the project activities.

Coordination Between Agencies

Thus far, most of the elements in the planned processes segment and the moderator variables of the organizing framework for nutrition activities and outcomes have been discussed. The one element to be added to the existing model is that of coordination and cooperation

between agencies. The literature makes few references to studies conducted in this area.

Interagency teamwork is becoming increasingly important in view of the recent tightening of budgets for agency programs. In the publication "Extension in the 80's, a Perspective for the Future of the Cooperative Extension Service," the expansion of interagency partnerships is encouraged.

Linkages...at all levels of government are efficient and important...particularly between USDA agencies and Extension...We believe that similar linkages--between Extension and several non-USDA agencies--would provide additional valuable information and education for the public and hence should be explored. Such arrangements, however, would have to be accompanied by agency resources adequate to provide for delivery of such information...Interagency partnerships are essential for efficient public service. (p. 20)

Shelton and Sorter (1980) formulated implications for Extension concerning interagency teamwork. They proposed several possible interagency models. A model, which seems to most nearly approximate that being used in this study, includes agency representatives and community leaders in a formal and regular relationship with responsibilities of planning, implementing and evaluating programs. Several factors were noted as important in effective voluntary interagency teamwork. These were goals, communication, leadership and group effectiveness. Relating to these factors, several considerations are offered for use by Extension both internally and externally in developing teamwork.

Set realistic goals that are clearly understood by all participants, reflect a shared sense of purpose of the participants and are responsive to changing needs of the community council, participants, and citizens.

Establish and maintain open communication among all participants to allow a free sharing of ideas, to build adequate trust and to promote understanding of the ideas that are presented by the members, as well as an understanding of the various agency programs.

Recognize that the leadership, to a large extent, determines what's accomplished; therefore, it's desirable that the leadership be shared by the participating members and not controlled by a few, and it's desirable to have the participating agencies and individuals provide resources to achieve a more effective use of resources.

Evaluate the effectiveness of teamwork by asking the following questions:

Do group members view the team as being successful relative to its goals and mission?

Are the members willing to sacrifice time to be active participants in the work of the team?

Is the team able to resolve conflict and make difficult decisions?

(p. 22-23)

Shelton and Sorter (1980) conclude that teamwork is as important in Extension as it is in any agency that works with a variety of groups. A lack of internal teamwork between program areas can lead to fragmentation and overlap of program efforts that hinder the most effective programming efforts. Development of teamwork between agencies can provide a way for Extension to develop more comprehensive programs to serve community purposes.

In a recent report, the United States Government Accounting Office (1982) stated that the coordination of

efforts in nutrition education is weak at all levels. Coordination of school-related nutrition education efforts is important to prevent unnecessary duplication of effort, maximize use of scarce resources and identify and share results of nutrition education efforts with others. Even as early as 1979 a task force recommended that USDA, Department of Health Education and Welfare (DHEW) and Education "demonstrate a coordinated approach to nutrition education...with other Federal agencies as well."

A study (Olien, Tichenar and Donahue, 1975) on the Mulligan Stew ETV project was designed to evaluate the cooperation between school systems and Extension Service. The promotion and distribution of the series of TV films on nutrition for nine to 11 year olds was prescribed as a systems model and involved the input of several agencies and groups including Extension Service, local broadcast stations and the school system personnel. Findings and rationale for this approach will be reported later in the review.

Evaluation of Nutrition Programs

With the great necessity for more effective programs to meet the social needs of our nation, evaluation is becoming increasingly important as a source of knowledge and direction. An evaluation tells which programs work effectively and which do not, and even more importantly,

it can identify effects of specific strategies and components within the program (Weiss, 1972). In general, program evaluation has been defined as providing information about the operation, implementation and effectiveness of a program (St. Pierre, 1982). Evaluation has similarities to research in that it seeks to describe and understand interrelationships between variables or trace out the causal sequence. Evaluation can often make direct inferences about causal links that lead from program to effect because the program intervenes in people's lives with the intent of causing change (Weiss, 1972).

A distinction can be made between formative and summative evaluation. Formative evaluation produces information that feeds back during the development of a curriculum to help improve it. Summative evaluation is done after the curriculum is finished and may provide information about the effectiveness of the program to officials who are considering adopting it (Kaufman and Thomas, 1980). In practice, evaluation most often helps with decisions about improvement in strategies and techniques of implementing a program. The usual end of evaluation is qualified results that recommend a different mix of services, clientele, organizational structure, procedures and mechanics or staffing patterns. These type of results are useful when extending a pilot to a larger program or adopting a technique through a system (Weiss, 1972).

Traditionally, the evaluation of nutrition education programs has focused on the behavioral change of participants. A new approach has been offered to evaluate instructional programs to operationally strengthen the integrity of the program while also describing the major effects and costs of obtaining them. The foundation of this approach is an analysis of program resources and procedures. Hanson and Schutz (1981) describe a methodology for nutrition education programs called program planning analysis which provides an overall summary of the empirical results and project implications for subsequent program operations.

St. Pierre (1982), when discussing evaluation of nutrition education, has concluded that when evaluating a nutrition education program the evaluator, client and program developer need to cooperate to set forth desirable outcomes that are reasonable upon the basis of past research. They should also consider the characteristics of different program outcomes. Based on constraints including time and funding they may need to concentrate on the assessment of proximate measures rather than distant outcomes alone. St. Pierre believes that even though behavior change is a desirable outcome, it may be an unfair outcome of in-school nutrition programs considering the lack of evidence that supports a clear relationship between knowledge and behavior change. He expresses a

concern for the evaluation of nutrition programs that fail to address out-of-school factors that influence children's eating patterns.

Several reports of innovative and systematic evaluation of nutrition programs are documented in the literature. A summative evaluation of a very prominent nutrition education program for youth, "Food Your Choice" was conducted ("Food Your Choice," 1978). This evaluation examined several effects, as well as program management variables related to this program, including education change in youth, classroom procedures, effectiveness of materials, time spent by teachers, changes in teacher behavior and costs. The study addressed the problems of program implementation that affect curriculum development.

A self-appraisal checklist developed by the Ohio State Department of Education (1981) for evaluating nutrition education programs in Ohio schools identifies seven major categories which represent essential aspects of school nutrition education programs and which should be addressed in evaluation. They are: philosophy, organization and administration, class management and instruction, staff, curriculum, facilities and equipment and evaluation procedures.

Considering the interdisciplinary nature of nutrition education, an interdisciplinary research team (Cunningham, Skinner, Cagle, Miller and Teets, 1981) developed and

evaluated a multidimensional measure of beliefs, the Comprehensive Assessment of Nutrition Knowledge, Attitudes and Practices (CANKAP). The model, based on a framework of goals and objectives, consists of an evaluation instrument for five developmental levels of a nutrition program, for elementary and secondary teachers, food service managers and workers, administrators and parents. The developers support the proposition that it is unlikely that any program can be validly analyzed without the input of the delivery personnel and auxiliary personnel who "influence what, when, where, by whom and perhaps even whether and how nutrition education is taught." They state that "spillover" of a nutrition education program may be an indicator of the success of the program because the involvement of parents can enhance a school program's success.

A Systems Approach to Management of Nutrition Programs

Management has been defined (Kast and Rosenzweig, 1979) as the coordination of human and material resources toward objective accomplishment. Four basic elements in management that can be identified are: (1) toward objectives, (2) through people, (3) via techniques and (4) in an organization or system. Stated another way, and related to the management of the Fitness Factor program in this research project, management is the process whereby

related or unrelated resources are integrated into a total system for objective accomplishment.

In evaluation of the Extension Service's Mulligan Stew ETV series, the authors (Olien, Tichenor and Donahue, 1975) identify the evaluation of a purposive message. They state that

the success of any purposive program for modifying levels of information, attitudes or behavior is highly dependent upon the integrated way in which the program is developed, perceived and delivered by the various interacting and interdependent groups and agencies. (p. 2)

The basis for the approach is a systems or macro effect which is especially important in programmatic evaluation in which there are distinct but interlocking subsystems. In this project, the subsystems identified were mass media, educational agencies and clientele. The value of such an approach is that the study of the structural context in which the program is developed, integrated and delivered will assist one in more effectively identifying factors that might assist in understanding or predicting the outcomes of future programs. This approach is, of course, an appropriate alternative to more traditional evaluations focusing only on behavior change of the audience. According to systems theory, each subsystem with interdependent and interacting roles has the power to make certain decisions that affect the action of the system. This theory also allows identification of sources of tension and conflict that can deteriorate or lead to

constructive change. The overriding finding of this study was that positive learning of participants was a consequence of organizational concentration on the content in the instructional setting (the classroom) and this in turn was the outcome of an organized and highly developed system that produced the educational series.

In considering the systems approach to management, the psychosocial system is an important component of one of the most critical aspects of management, the integration of individual efforts. This aspect of management has been called leadership. There are many components of leadership action including influence systems, power, and authority (Hersey and Blanchard, 1982). In working with organizations such as school systems and other public agencies and with community groups, these components would need to be considered in relation to obtaining approval, support and eventually adoption of any new idea or program. Rogers discusses the importance of opinion leaders in influencing the adoption of ideas (Poolton, 1972).

The Research Model and Hypotheses

The literature review was helpful in developing a framework and research model for studying the implementation effort of the revised Fitness Factor program. A literature search early in the program revision phase indicated the limited evidence of behavioral change of youth as a result of in-school nutrition education

programs. While nutrition knowledge of youth may increase, the application of this knowledge to food choices has been shown to be minimal. For these reasons, the study was designed to measure practice and attitude changes in youth as a result of the program and actual food consumption over a 24-hour period. Offered as a possible limitation to the application of knowledge has been the influence of parental attitudes and food availability at home and school. Therefore, the parent education component of the program was stressed in the implementation effort.

The literature review also facilitated identification of program management variables that might influence outcome of the nutrition education effort. Those variables selected after a review of the literature included classroom teacher training methods, teacher's experience with nutrition education, adherence to the curriculum and adequacy of coverage, confidence level of teachers, support given to teachers by the Extension Home Economist (as a nutrition resource) and cooperation of other school and agency personnel in the nutrition education effort. Adapting systems models of evaluation offered by Hanson and Schutz (1981), St. Pierre (1982) and Olien, Tichenor and Donahue (1975), a research model for this study was created. The model combines a more traditional evaluation of behavior change of the audience with an evaluation of

the structural context of the program effort including identification of factors that might assist in predicting outcomes of future programs. This study, therefore, might be described as a program planning analysis, as suggested by Hanson and Schutz (1981), providing a summary of empirical results and project implications for future program operations.

The following hypotheses were formed based on information gained from the literature review, from the research effort on the original Fitness Factor program, and from the researcher's theoretical base for the study. The hypotheses are stated in the null hypothesis format.

H₀ 1. The frequency of selected food and fitness practices of youth will not be affected by implementation of the food and fitness educational program.

H₀ 2. The attitudes of youth toward factors affecting their food choice will not be affected by implementation of the food and fitness educational program.

H₀ 3. Student food consumption over a 24-hour period will not be affected by implementation of the food and fitness educational program.

H₀ 4. There will be no differences among the changes in selected food and fitness practices of the nine parish groups of youth participants.

- H₀ 5. There will be no differences among the changes in selected attitudes of the nine parish groups of youth participants.
- H₀ 6. There will be no differences among the changes in 24-hour food consumption of the nine parish groups of youth participants.
- H₀ 7. The changes in Nutrition Practices of youth cannot be predicted by teacher or program management variables.
- H₀ 8. The changes in Nutrition Attitudes of youth cannot be predicted by teacher or program management variables.
- H₀ 9. Changes in Nutrition Practices of youth will not be affected by the Extension Home Economist's frequent participation in the classroom.
- H₀ 10. Changes in Nutrition Attitudes of youth will not be affected by the Extension Home Economist's frequent participation in the classroom.

CHAPTER III

RESEARCH METHODOLOGY

The Fitness Factor program was implemented by trained Extension Home Economists in selected schools in nine parishes (counties) in Louisiana during the 1983-84 school year. Home Economists secured approval from school administration to implement the program in fifth grade classes during a six to nine week period. Teachers who actually taught the lessons in the classroom were trained by the Extension Home Economists. This research project evaluated the results of the program implementation.

Method of Data Collection

Three sources of primary data were collected: (1) responses of youth to a pretest/posttest Nutrition Practices and Attitudes Questionnaire and a pretest/posttest Food Intake Record; (2) responses of classroom teachers in the study to a Program Evaluation Questionnaire administered by mail after the program; and (3) responses of parish Home Economists to a Program Evaluation Questionnaire administered after the program.

Youth Questionnaire. A two-part pretest/posttest instrument measured nutrition behavior change of youth (Appendix). The first part of the instrument was a Nutrition Practices and Attitudes Questionnaire consisting of

27 items based on concepts covered in the Fitness Factor program. Seventeen of the items (Nutrition Practices) asked the students to indicate on a four-point frequency scale if they performed the food or fitness practice (1) Usually or Very Often, (2) Fairly Often, (3) Occasionally or (4) Seldom or Never. Ten items (Nutrition Attitudes) asked the youth to indicate the importance of certain factors when selecting foods. The importance scale was (1) Very Important, (2) Fairly Important or (3) Not Important.

The second part of the instrument was a Food Intake Form (a 24-hour food intake inventory) designed to determine any changes in number of food group servings of participants.

The instrument was developed and tested in the original pilot of the educational program. Authors of the program developed the Nutrition Practices and Nutrition Attitudes Questionnaire specifically to test for change in certain behaviors of youth as a result of the program. The instrument was reviewed for validity by a panel of nutrition educators prior to use. It was also tested for fifth grade level using the FOG readability index. After initial use, a panel of fifth grade classroom teachers involved in the original pilot reviewed the instrument for readability and understanding by their students.

For this study, the pretest/posttest youth questionnaire was administered to students at school in a group situation by the Home Economist. The pretest was administered one to three weeks prior to the beginning of the program and the posttest six weeks to two months after program completion. Home Economists were trained to administer the questionnaire in a standardized manner. For the Nutrition Practices and Nutrition Attitudes section, the Home Economist read each questionnaire item to the students, allowing time for students to answer after each item. For the 24-hour food recall, students were instructed to write down everything they had to eat and drink for the past 24 hour period. Each of the three meals and snack periods between meals were addressed one at a time starting with the most recent meal or snack and working backwards. Food models were used to help explain serving size.

Classroom Teacher Questionnaire. The classroom teacher questionnaire, administered as a mail questionnaire after program completion, recorded responses of classroom teacher participants to selected items related to program evaluation of the Fitness Factor (Appendix). Information gained from the preliminary review of literature and a prestudy questionnaire administered to Extension Home Economists was a basis for development of the questionnaire. The questionnaire was pretested by two

fifth grade classroom teachers and was reviewed by one evaluation expert and one nutrition educator. The questionnaires were sent to teachers with a self-addressed stamped envelope for return to the researcher.

Extension Home Economist Questionnaire. The Home Economist questionnaires recorded responses to selected items concerning program success and program management. A prestudy questionnaire helped identify program management variables to be considered in final evaluation of the program by teachers and Home Economists (Appendix). The final program evaluation questionnaire investigated program management methods and attitudes of Home Economists (Appendix). The final questionnaire was reviewed before use by an evaluation expert and a nutrition educator. The Home Economist questionnaires were administered to the Home Economist program coordinator in each parish by the researcher in a personal interview situation.

The Population

Youth participants were fifth grade students in 20 selected schools in nine Louisiana parishes. Data were collected and analyzed for 1248 students who completed both pretest and posttest.

Forty-nine (49) classroom teachers were trained to teach the Fitness Factor program to youth participants in

their classrooms. Forty-five (45) teachers, 92 percent, returned the mail questionnaire administered after program completion.

Fourteen Extension Home Economists in nine parishes were responsible for implementation of the program. Seven Home Economists were assigned to the 4-H program area, four were assigned to adult Home Economics work, two had joint assignments to both 4-H and adult work and one was assigned to the Expanded Food and Nutrition Education Program. In parishes with more than one Home Economist participating, one was appointed program coordinator and had primary responsibility for the program implementation and evaluation effort for the parish.

Selection of participants for the study was partially dependent upon approval of both Cooperative Extension and school administrative approval, and was therefore not under complete control of the researcher. In consultation with Extension administrators, nine parish Home Economists, one from each of the nine Extension Areas in the state, were appointed to serve as program coordinators. In some parishes additional Home Economists assisted with the program. The Home Economist coordinators were asked to secure the participation of a sufficient number of fifth grade classes to obtain a population of 150 to 200 students per parish. The fifth grade classes and schools to be involved were then selected in consultation with

parish school administrators. A total of 49 classes in nine parishes constituted the total population of youth.

Although study of the sociocultural characteristics of the youth population was not a purpose of the research, some sociocultural data were collected. Teachers were asked to provide a list of students indicating appropriate race and sex. Table 1 summarizes the selected sociocultural characteristics of the youth participants. Females constituted 51.4 percent of the group and males constituted 48.1 percent. Slightly over half, 51 percent, of the participants were black, while 47.8 percent were white and 0.6 percent were of other races. The high proportion of black participants may be explained by the fact that the selected schools were public schools.

Method of Data Analysis

Statistical tests were performed on the data collected to test the following null hypotheses:

H_0 1. The frequency of selected food and fitness practices of youth will not be affected by implementation of the food and fitness educational program.

H_0 2. The attitudes of youth toward factors affecting their food choice will not be affected by implementation of the food and fitness educational program.

Table 1. Frequency Distribution of Youth Participants
by Selected Sociocultural Characteristics
(N = 1248)*

Characteristic	Number	Percent
Sex:		
Male	600	48.1
Female	641	51.4
Race:		
Black	636	51.0
White	596	47.8
Other	7	0.6

*Incomplete data for some participants resulted in less than 100 percent totals for characteristics.

- H₀ 3. Student food consumption over a 24-hour period will not be affected by implementation of the food and fitness educational program.
- H₀ 4. There will be no differences among the changes in selected food and fitness practices of the nine parish groups of youth participants.
- H₀ 5. There will be no differences among the changes in attitudes of the nine parish groups of youth participants.
- H₀ 6. There will be no differences among the changes in 24-hour food consumption of the nine parish groups of youth participants.
- H₀ 7. The changes in Nutrition Practices of youth cannot be predicted by teacher or program management variables.
- H₀ 8. The changes in Nutrition Attitudes of youth cannot be predicted by teacher or program management variables.
- H₀ 9. Changes in Nutrition Practices of youth will not be affected by the Extension Home Economist's frequent participation in the classroom.
- H₀ 10. Changes in Nutrition Attitudes of youth will not be affected by the Extension Home Economist's frequent participation in the classroom.

To test the hypotheses, it was necessary to have a measure of the youth's reported behavior on each of the three sections of the youth questionnaire: (a) Nutrition Practices, (b) Nutrition Attitudes and (c) 24-Hour Food Intake Form. Differences between pretest and posttest mean scores were then analyzed for significance to determine changes in youth behavior. Composite scoring systems were developed for the Nutrition Practices and Nutrition Attitudes sections by assigning points to each of the possible answers for each item, then summing to obtain an overall measure for each of the two sections. The assignment of points was based on the advice of a panel of one Extension Nutritionist, one independent nutrition consultant and one Extension Program Analyst.

The list of the 17 Nutrition Practices which were developed to cover concepts of the nutrition program and the points assigned to the possible responses follow. The total score for the Nutrition Practices composite was 51. A total of three points was possible for each individual item.

<u>Nutrition Practice</u>	<u>Usually or Very Often</u>	<u>Fairly Often</u>	<u>Occa- sionally</u>	<u>Seldom or Never</u>
1. Try new foods.....	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
2. Choose foods for meals from 4 main food groups.....	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
3. Eat breakfast.....	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>

4. Eat 10 or more different kinds of foods each day.....	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
5. Try different kinds of diets to lose weight...	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>
6. Choose snack foods from four food groups..	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
7. Ask for cereals and snacks advertised on T.V.	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>
8. Play or work instead of watching T.V.	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
9. Help prepare meals	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
10. Help make food selections at grocery	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
11. Exercise 15-30 min. 3 times/week.....	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
12. Read food labels for ingredients.....	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
13. Eat candy or sweets....	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>
14. Brush teeth after eating sweet foods.....	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
15. Balance energy of food with energy of activities.....	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
16. Eat pretzels or chips..	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>
17. Take vitamins.....	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>

For the Nutrition Attitudes section, the selected factors influencing children's food choices were not considered to be of equal importance, so they were assigned values accordingly. For two items, items 1) The taste and 7) What parents usually choose, the influence

was considered to be either neutral or beyond control of the youth, so in the final analysis of data, the possible responses were assigned equal points. The total possible score for the Nutrition Attitudes composite was 24.

<u>Attitude Factor</u>	<u>Importance Level</u>		
	<u>Very Important</u>	<u>Fairly Important</u>	<u>Not Important</u>
1. The taste?	<u>1</u>	<u>1</u>	<u>1</u>
2. What friends are choosing?	<u>0</u>	<u>1</u>	<u>2</u>
3. The nutritive value?	<u>5</u>	<u>3</u>	<u>0</u>
4. Your energy needs?	<u>3</u>	<u>2</u>	<u>0</u>
5. The cost?	<u>2</u>	<u>1</u>	<u>0</u>
6. The time it takes to prepare or eat?	<u>2</u>	<u>1</u>	<u>0</u>
7. What parents usually choose?	<u>1</u>	<u>1</u>	<u>1</u>
8. The effect on your weight?	<u>3</u>	<u>2</u>	<u>0</u>
9. The effect on your teeth?	<u>3</u>	<u>2</u>	<u>0</u>
10. How happy or unhappy you're feeling?	<u>0</u>	<u>1</u>	<u>2</u>

Table 2 gives the scoring system used for the 24-hour Food Intake Form. A scoring system based on the recommended number of servings of the four required food groups was used. The system developed and used by the Extension Expanded Food and Nutrition Education Program was adapted for use with the Fitness Factor program by changing the

Table 2. Scoring Table for Twenty-Four Hour Diet

To find the Twenty-four Hour Diet score:

1. Select the appropriate table (below) on the basis of the number of milk servings reported.
2. Select the proper column of the table on the basis of the number of meat servings reported.
3. Select the proper area of the table on the basis of the number of vegetable/fruit servings reported.
4. Find the proper line of the table on the basis of the number of bread/cereal servings reported.

The number to the right of this (in type style "74") is the Twenty-four Hour Diet score.

0-1 MILK SERVINGS								
0 MEAT SERVINGS			1 MEAT SERVING			(2) MEAT SERVINGS		
Veg Fruit	Bread Cereal	Score	Veg Fruit	Bread Cereal	Score	Veg Fruit	Bread Cereal	Score
0	0	0	0	0	3	0	0	6
	1	2		1	10		1	14
	2	4		2	12		2	17
	3	6		3	15		3	25
	(4)	8		(4)	23		(4)	29
1	0	2	1	0	10	1	0	14
	1	9		1	22		1	27
	2	11		2	25		2	35
	3	13		3	33		3	39
	(4)	21		(4)	37		(4)	43
2	0	4	2	0	12	2	0	17
	1	11		1	25		1	35
	2	13		2	33		2	39
	3	21		3	37		3	43
	(4)	25		(4)	41		(4)	47
3	0	6	3	0	15	3	0	25
	1	13		1	33		1	39
	2	21		2	37		2	43
	3	25		3	41		3	47
	(4)	29		(4)	45		(4)	60
(4)	0	8	(1)	0	23	(4)	0	29
	1	21		1	37		1	43
	2	25		2	41		2	47
	3	29		3	45		3	60
	(4)	33		(4)	58		(4)	65

2 MILK SERVINGS								
0 MEAT SERVINGS			1 MEAT SERVING			(2) MEAT SERVINGS		
Veg Fruit	Bread Cereal	Score	Veg Fruit	Bread Cereal	Score	Veg Fruit	Bread Cereal	Score
0	0	3	0	0	11	0	0	16
	1	10		1	24		1	29
	2	12		2	27		2	37
	3	15		3	35		3	41
	(4)	23		(4)	39		(4)	45
1	0	10	1	0	24	1	0	29
	1	22		1	42		1	52
	2	26		2	50		2	56
	3	33		3	54		3	60
	(4)	37		(4)	58		(4)	64
2	0	12	2	0	27	2	0	37
	1	25		1	50		1	56
	2	33		2	56		2	62
	3	37		3	60		3	66
	(4)	41		(4)	64		(4)	79
3	0	15	3	0	35	3	0	41
	1	33		1	54		1	60
	2	37		2	60		2	66
	3	41		3	64		3	79
	(4)	45		(4)	77		(4)	85
(4)	0	23	(4)	0	39	(4)	0	45
	1	37		1	58		1	64
	2	41		2	64		2	79
	3	45		3	77		3	85
	(4)	58		(4)	82		(4)	91

(3) MILK SERVINGS								
0 MEAT SERVINGS			1 MEAT SERVING			(2) MEAT SERVINGS		
Veg Fruit	Bread Cereal	Score	Veg Fruit	Bread Cereal	Score	Veg Fruit	Bread Cereal	Score
0	0	8	0	0	16	0	0	21
	1	14		1	29		1	39
	2	17		2	37		2	43
	3	25		3	41		3	47
	(4)	29		(4)	45		(4)	51
1	0	14	1	0	29	1	0	39
	1	27		1	52		1	58
	2	35		2	56		2	62
	3	39		3	60		3	66
	(4)	43		(4)	64		(4)	80
2	0	17	2	0	37	2	0	43
	1	35		1	56		1	62
	2	39		2	62		2	68
	3	43		3	66		3	82
	(4)	47		(4)	79		(4)	88
3	0	25	3	0	41	3	0	47
	1	39		1	60		1	66
	2	43		2	66		2	82
	3	47		3	79		3	88
	(4)	60		(4)	85		(4)	94
(4)	0	29	(4)	0	45	(4)	0	51
	1	43		1	64		1	80
	2	47		2	79		2	88
	3	60		3	85		3	94
	(4)	65		(4)	91		(4)	100

required number of Milk-Cheese food group servings from two for adults to three for youth. Two Extension Nutritionists scored the completed 24-Hour Food Intake Forms of youth participants. The total possible score for the Food Intake Form was 100.

To test hypotheses one, two and three, group composite means were computed for pretest and posttest on the Nutrition Practices, Nutrition Attitudes and Food Intake Form of the youth questionnaire. Differences between pretest and posttest group composite means were then computed and analyzed for significance using the t-test.

To test hypotheses four, five and six, the analysis of variance procedure was used to test the significance of differences among the nine parish groups on the change in behavior between pretest and posttest. Differences in the Nutrition Practices, Nutrition Attitudes and the 24-Hour Food Intake measures were analyzed separately. The Scheffé procedure was used to identify where differences between groups occurred.

To test hypotheses seven and eight, multiple regression was used to identify significant predictors of the students' change in Nutrition Practices and Attitudes. An analysis was done on the class level using Nutrition Practices differences between pretest and posttest group means as the dependent variable and selected program

management and teacher variables as the independent or predictor variables. A second regression was done using Nutrition Attitudes differences between pretest and post-test group means as the dependent variable and the same selected independent or predictor variables. The independent variables were chosen based on theoretical assumptions formed from information gained from the literature review and the initial pilot effort of the Fitness Factor program. The classroom teacher questionnaire was designed to collect information on the variables. Variables included were level of parental involvement, number of parent activities used, number of lessons used, number of units adequately covered, number of teacher training methods used, confidence level of classroom teachers, number of agent contacts with teachers during the program, number of resource persons used, teacher's years of teaching experience, teacher's prior training in nutrition and teacher's prior experience teaching nutrition.

To test hypotheses nine and 10, analysis of variance was used to test the significance of differences between group means on pretest and posttest on the parish level for those groups whose Home Economist participated frequently in the classroom versus those whose did not.

In reporting results of significance tests for this study, the .05 level of significance is accepted as statistically significant.

CHAPTER IV
ANALYSIS OF CHANGES IN
FOOD AND FITNESS BEHAVIOR OF YOUTH

There was some evidence of positive behavioral change in the food and fitness habits of youth as indicated by analysis of youth data. This section begins with a presentation of overall results for the three scales, Nutrition Practices, Nutrition Attitudes and 24-Hour Food Intake, followed by a more detailed analysis of change on individual Practice and Attitude items. The null hypothesis relating to each scale formed a focus for the presentation of data. The overall results indicate the effectiveness of the course, while the individual items focus on specific points of strength and weakness. A final section analyzes the differences among the nine parish groups of youth participants on each of the three measures.

Overall Changes in Food and Fitness Behavior

Data were analyzed only for those students completing both pretest and posttest. Composite scoring systems (presented in Chapter III) were developed to quantify responses of youth to each section of the youth questionnaire and to provide a mechanism for comparing pretest and

posttest performances. Pretest means were subtracted from posttest means to determine if behavior changes occurred.

Tables 3, 4 and 5 present the distributions of differences between pretest and posttest scores for Nutrition Practices, Nutrition Attitudes and 24-hour Food Intake. For each measure, there is variability; however, the largest number of cases appear to be clustered about a few points above and below zero. This indicates that scores were close to the normal curve, indicating change in both negative and positive directions. In Nutrition Practices, 643 cases or 51.5 percent of the youth had a positive change between pretest and posttest, while 527 cases or 42.2 percent had a negative change. No change was indicated for 78 cases or 6.3 percent. In Nutrition Attitudes 574 cases or 47.4 percent had a positive change, 514 or 42.4 percent had a negative change and 158 cases or 13 percent had no change.

For the 24-Hour Food Intake, 500 cases or 41.3 percent of the youth had a positive change between pretest and posttest, while 626 cases or 51.7 percent had a negative change. No change was indicated for 85 cases or 7.0 percent. Thus, the data show that on Nutrition Practices and Nutrition Attitudes, there was a greater percentage of youth having a positive change between pretest and posttest, while on the 24-Hour Food Intake there was a larger percentage who had a negative change between pretest and

Table 3. Distribution of Differences in Nutrition Practices of Youth Between Pretest and Posttest.* (N = 1248)

Difference	Frequency	Percent
-24 to - 9	94	7.5
- 8 to - 5	161	12.9
- 4 to - 1	272	21.8
0	78	6.3
+ 1 to + 4	322	25.8
+ 5 to + 8	184	14.7
+ 9 to +23	137	11.0
Total	1248	100.0

*Each of the 17 Practice items had a total possible of three points, giving a total range on the pretest and posttest Practice scale of 0 to 51.

Table 4. Distribution of Differences in Nutrition Attitudes of Youth Between Pretest and Posttest.* (N = 1246)

Difference	Frequency	Percent
-16 to - 5	119	9.6
- 4 to - 3	154	12.4
- 2 to - 1	241	19.3
0	158	12.7
+ 1 to + 2	281	22.5
+ 3 to + 4	160	12.8
+ 5 to +14	133	10.7
Total	1246	100.0

*The 10 Attitude items were assigned different numbers of points according to relative importance; the total scale on both pretest and posttest ranges from two to 24.

Table 5. Distribution of Differences in 24-Hour Food Intake Between Pretest and Posttest.*
(N = 1211)

Difference	Frequency	Percent
-89 to -54	64	5.3
-53 to -45	57	4.7
-44 to -27	175	14.4
-26 to -11	195	16.1
-10 to - 6	64	5.3
- 5 to - 1	71	5.8
0	85	7.0
+ 1 to + 5	65	5.4
+ 6 to +10	65	5.4
+11 to +26	194	16.0
+27 to +45	117	9.7
+46 to +88	59	4.9
Total	1211	100.0

*Scale of possible points on both pretest and posttest ranges from 0 to 100.

posttest. As will be further discussed, this finding agrees with previous research showing that actual food consumption of youth may be more difficult to improve as a result of a nutrition education effort, possibly due to out-of-school factors such as parental influence and food availability.

Table 6 presents a summary of overall changes in Nutrition Practices, Nutrition Attitudes and 24-Hour Food Intake of youth. The first null hypothesis states that the frequency of selected food and fitness practices of youth will not be affected by implementation of the food and fitness educational program. In order to test the hypothesis, the difference between pretest and posttest group composite means for the 17 Nutrition Practices was computed and analyzed for significance using a t-test. The pretest mean was 28.85 and the posttest mean was 29.51 with the total possible scale of 51 points. An improvement in food and fitness practices was indicated by the growth of .66 points. Although not a large difference, this difference was statistically significant at the .0004 level with a t value of 3.54. Therefore, null hypothesis number one is rejected, indicating that the improvement in food and fitness practices as indicated by the difference between pretest and posttest group means is not due to chance. Even the small change in behavior may be an important finding since most nutrition education programs

Table 6. Changes in Nutrition Practices, Nutrition Attitudes and 24-Hour Food Intake of Youth.(a)

Measure of Behavior	Mean	Difference	t value	Sign Level
Nutrition Practices (b)				
Pretest	28.85	0.66	3.54	.0004
Posttest	29.51			
Nutrition Attitudes (c)				
Pretest	17.79	.14	1.34	.182
Posttest	17.93			
24-Hour Food Recall (d)				
Pretest	66.32	-4.78	-5.52	.0001
Posttest	61.56			

(a) The change in Nutrition Practices is based on 1248 cases; Nutrition Attitudes based on 1246 cases; and the change in Food Recall on 1211 cases. Discrepancies between means and the amount of change are due to rounding error.

(b) Total possible score = 51.

(c) Total possible score = 24.

(d) Total possible score = 100.

have been able to measure nutrition knowledge change, but very few have been able to show practice change. Practice change has been shown to be more difficult to bring about and measure, possibly due to the short-term nature of the nutrition programs. The results of this study appear to be similar to those of the Mulligan Stew series reported by Shapiro, et al. (1974).

Null hypothesis number two states that the attitudes of youth toward factors affecting their food choices will not be affected by the implementation of a food and fitness education program. To test the hypothesis, the difference between pretest and posttest group means for the 10 Nutrition Attitudes items was computed and analyzed for significance using a t-test. The pretest mean was 17.79 and the posttest mean was 17.93 on a total scale of 24 points. The computed difference of .14 between pretest and posttest group composite means was positive, indicating a change in attitude toward food choices in the desired direction; however, the difference was not statistically significant. Analysis of the difference showed a t value of 1.34 at the .18 level. Therefore, the null hypothesis cannot be rejected, indicating that the positive change in attitude toward food choice could have been due to chance.

Null hypothesis number three states that the student food consumption over a 24-hour period will not be

affected by implementation of a food and fitness educational program. For the 24-hour Food Intake, the scoring system adapted from the Extension EFNEP Program was used to compute scores from the pretest and posttest Intake Forms. Group composite means were computed and the difference between pretest and posttest means was tested for significance using a t-test. The pretest group mean was 66.32 and the posttest mean was 61.56 with a total possible score of 100 points. The difference between pretest and posttest means was statistically significant at the .0001 level with a t value of -5.52. This indicates a negative change in food consumption of youth between pretest and posttest. Therefore, the null hypothesis is rejected, indicating that the student food consumption over a 24-hour period was affected by implementation of the program and the finding was not due to chance.

Lack of a positive change in the 24-hour food consumption of youth is not a desired outcome of the program. It is possible that the food consumption patterns of youth may depend more on food availability factors at home and school than on the preferred choices of youth. This explanation is supported by the observation that, in most cases, the school lunch was the only balanced meal of the day for children. From previous research, Birch (1980) predicted that parental preferences may limit the set of

available foods in the home. Yperman and Veermeersch (1979) also reported the importance of parental factors in conditioning children's food behavior. Singleton and Rhoads (1981) conclude from a needs assessment of Louisiana students that parents in Louisiana have a great influence on their child's eating habits. Many references in the literature also referred to the influence of other socioeconomic factors in influencing children's diets, including peer influence.

While not a desired outcome, this negative finding, then, may indicate the need for Extension to place more emphasis on extending the nutrition education effort to parents (food providers at home). Baker (1982) states that changes in children's food preferences and behavior may lie in education targeted at parents. Although most classroom teachers in the study attempted use of the parent education activities included in the Fitness Factor program, the level of parental involvement reported was generally low. This tracks the lack of success in getting parents to attend meetings reported by Head (1974). Head also identified lack of reinforcement of concepts in the home as a limitation of nutrition project activities.

Changes in Nutrition Practices Items

For each of the 17 Nutrition Practices items, differences between pretest and posttest group means were computed and analyzed in an attempt to determine possible

strength and weakness areas of the educational curriculum. Table 7 shows the statistical findings for the 17 Nutrition Practices. A positive change in students' reported behavior between pretest and posttest was indicated for nine of the 17 items: items 1) Try new foods; 5) Try different kinds of diets to lose weight; 7) Ask for cereals and snacks advertised on TV; 8) Play or work instead of watching TV; 13) Eat candy or sweets; 14) Brush teeth after eating sweet foods; 15) Balance energy of food with energy of activities; 16) Eat pretzels or chips and 17) Take vitamins. The differences were statistically significant for items 1) Try new foods ($p < .05$); 7) Ask for cereal and snacks advertised on TV ($p < .0001$); 8) Play or work instead of watching TV ($p < .005$); 13) Eat candy or sweets ($p < .0001$); 15) Balance energy of food with energy of activity ($p < .002$) and 16) Eat pretzels or chips ($p < .0001$). Although not statistically significant, the difference for item 17) Take vitamins, should be recognized as important with a significance level of .06.

A negative change in student's reported behavior between pretest and posttest was indicated for eight items: items 2) Choose foods for meals from four main food groups; 3) Eat breakfast; 4) Eat 10 or more different kinds of foods each day; 6) Choose snacks from four food groups; 9) Help prepare meals; 10) Help make food selections at grocery; 11) Exercise 15-30 minutes three times

Table 7. Changes in Nutrition Practices Items of Youth.* (N = 1248)

Item	Means	Difference	t value	Sign Level
1. Try new foods				
Pretest	1.66	0.06	1.94	.052
Posttest	1.72			
2. Choose foods for meals from 4 main food groups				
Pretest	2.06	-0.14	-3.78	.0002
Posttest	1.92			
3. Eat breakfast				
Pretest	2.46	-0.03	-1.00	.315
Posttest	2.43			
4. Eat 10 or more different kinds of foods each day				
Pretest	1.54	-0.01	-0.25	.802
Posttest	1.53			
5. Try different kinds of diets to lose weight				
Pretest	2.50	0.01	0.32	.746
Posttest	2.51			
6. Choose snack foods from four food groups				
Pretest	1.68	-0.01	-0.30	.761
Posttest	1.67			
7. Ask for cereals and snacks advertised on T.V.				
Pretest	1.31	0.20	5.26	.0001
Posttest	1.52			
8. Play or work instead of watching T.V.				
Pretest	1.81	0.11	2.79	.005
Posttest	1.92			
9. Help prepare meals				
Pretest	1.60	-0.02	-0.70	.487
Posttest	1.58			

Table 7. (continued)

Item	Means	Difference	t value	Sign Level
10. Help make food selections at grocery				
Pretest	1.93	-0.11	-3.21	.001
Posttest	1.82			
11. Exercise 15-30 min. 3 times/ week				
Pretest	2.01	-0.01	-0.20	.839
Posttest	2.00			
12. Read food labels for ingredients				
Pretest	1.36	-0.01	-0.40	.687
Posttest	1.35			
13. Eat candy or sweets				
Pretest	0.91	0.23	6.96	.0001
Posttest	1.14			
14. Brush teeth after eating sweet foods				
Pretest	2.05	0.03	1.07	.285
Posttest	2.08			
15. Balance energy of food with energy of activities				
Pretest	1.57	0.12	3.07	.002
Posttest	1.69			
16. Eat pretzels or chips				
Pretest	0.95	0.18	5.26	.0001
Posttest	1.13			
17. Take vitamins				
Pretest	1.42	0.06	1.87	.061
Posttest	1.48			

*Discrepancies between means and differences are due to rounding errors. These means are based on a scale from 0 to 3, with 0 as the least desirable response and 3 as the most desirable.

per week; and 12) Read food labels for ingredients. However, only two of the items, items 2) Choose foods for meals from four main food groups and 10) Help make food selections at grocery, had differences that were statistically significant.

Although a definite pattern cannot be seen in the findings relating to the individual Nutrition Practices, some strengths and weaknesses of the program are implied. The influence of television on food choices seems to have been lessened by the effect of the program as shown by the positive results of items 7) Ask for cereals and snacks advertised on TV and 8) Play or work instead of watching TV, which were statistically significant. Baker (1972) offers television as a major influence on children's food choices and reports that "TV and radio advertisements" was a factor most often reported by parents as influencing their children's food choices. Other strengths of the program have to do with choice of empty-calorie foods such as sweets and salty foods, and energy balance. Shapiro et al. (1974) reported an increased awareness of empty-calorie foods as a result of the Mulligan Stew series. The positive statistically significant difference for item 1) Try new foods may indicate that the program can be effective in increasing the child's acceptance of new foods. The seven agents doing the stir-fry vegetable lesson in the classroom did indicate that, to their

surprise, the children were anxious to try the new vegetables and did eat them. Since each of these three areas, influence of TV on food choice, empty-calorie foods, and trying new foods were strong basic concepts stressed in the program, these findings may indicate the completeness of project activities in these areas. On the other hand, it could be that children did not have cooperation of parents in performing practice 10) Help make selections at the grocery and this influenced the negative change that was statistically significant.

Changes in Nutrition Attitudes Items

Ten questions were asked relating to the influence of certain factors on the food choices (attitudes) of youth. These factors were stressed in the educational curriculum. In an effort to determine areas of curriculum strength and weakness, differences between pretest and posttest means were computed and analyzed for significance using a t-test for each of the individual items. Table 8 shows statistical findings for eight of the Nutrition Attitudes items. Two items were considered neutral (Chapter III) and were not included in this individual item analysis. For five of the Nutrition Attitudes items, positive changes in behavior between pretest and posttest were indicated and were statistically significant. Those items with positive changes were items a) What friends are choosing; c) Your

Table 8. Changes in Nutrition Attitudes of Youth
Toward Factors Affecting Food Choice.*
(N = 1211)

Factor/Total Possible Score	Means	Difference	t value	Sign Level
a. What friends are choosing/2				
Pretest	1.52	.06	2.25	.02
Posttest	1.57			
b. The nutritive value/5				
Pretest	3.83	-.03	-0.56	.58
Posttest	3.80			
c. Your energy needs/3				
Pretest	2.49	.07	2.30	.02
Posttest	2.56			
d. The cost/2				
Pretest	1.23	-.08	-2.83	.005
Posttest	1.15			
e. The time it takes to prepare or eat/2				
Pretest	1.08	-.15	-5.10	.0001
Posttest	.93			
f. The effect on your weight/3				
Pretest	2.13	.08	2.14	.03
Posttest	2.21			
g. The effect on your teeth/3				
Pretest	2.64	.13	5.14	.0001
Posttest	2.76			
h. How happy or unhappy you're feeling/2				
Pretest	0.89	.06	2.15	.03
Posttest	0.95			

*Discrepancies between means and differences are due to rounding errors.

energy needs, f) The effect on your weight, g) The effect on your teeth, and h) How happy or unhappy you're feeling. There were negative changes for three items: items b) The nutritive value; d) The cost; and e) The time it takes to prepare or eat. The differences were statistically significant for items d) and e).

Of special importance is the positive change in items a) What friends are choosing, c) Your energy needs and f) The effect on your weight. Much has been reported in the literature about the influence of peers on food choice (Yperman and Veermeersch, 1979). The program has appeared to reduce the effect of peer influence on food choice. The concept of energy balance appears to have been adequately covered in the program as Nutrition Attitudes items c) and f) relate to this concept, as did the Nutrition Practices item on balancing energy of foods with energy of activity.

Differences Between Parish Groups of Youth

Thus far, the results reported have been based on the entire population of youth participants. However, nine different parish groups were involved in the implementation effort. It was suspected that differences in results among parish groups might occur due to varying factors including characteristics and program management of the Extension Home Economist, socioeconomic level of

the participant families, and rural vs. urban vs. suburban population. Since only nine parish groups were involved in the program, the variability of factors related to the parish groups was limited. This made some statistical procedures infeasible. However, for purposes of making recommendations for future program efforts, tests were performed to see if significant differences among groups did occur and where the differences were. Reasons for the differences might then be theorized in order to guide future program efforts and possibly future research efforts.

Table 9 shows the differences between pretest and posttest group means of the nine parish groups of youth on the Nutrition Practices, Nutrition Attitudes and 24-Hour Food Intake composites. For purposes of reporting, the parish groups were identified with a number one through nine. For the Nutrition Practices, six groups, Groups 1, 3, 4, 7, 8 and 9 showed a positive change between pretest and posttest; three groups, Groups 2, 5 and 6 did not. For Nutrition Attitudes, six groups, Groups 1, 4, 5, 7, 8 and 9 showed a positive change between pretest and posttest; three groups, Groups 2, 3 and 6 did not. For the 24-Hour Food Intake measure, two groups, Groups 6 and 9 showed a positive change between pretest and posttest; the other seven groups did not. Group 9 was the only group that showed a positive change in behavior between pretest

Table 9. Differences Between Pretest and Posttest Group Composite Means of Nine Parish Groups on Nutrition Practices, Nutrition Attitudes and 24-Hour Food Intake.

Group	Differences Between Pretest and Posttest Means		
	Nutrition Practices	Nutrition Attitudes	24-Hour Food Intake
1	.567	.194	-27.030*
2	-0.179	- .199	- 7.373*
3	.195	-1.675*	- 0.763
4	1.756*	0.545*	- 4.415*
5	-1.077	0.374	- 2.560
6	-1.466	-0.425	5.137*
7	0.656*	0.048	- 9.170*
8	0.275	0.958*	- 6.867*
9	4.425*	1.724*	17.595*

*Difference was statistically significant at the .05 level.

and posttest for all three of the youth measures, and each of the changes was statistically significant. For each measure Group 9 also had a greater positive change than any other of the nine groups.

Null hypothesis number four states that there will be no differences among the changes in selected food and fitness practices of the nine parish groups of youth. To test for statistically significant differences among parish groups on change in Nutrition Practices between pretest and posttest, an analysis of variance procedure was used. The differences among groups were statistically significant at the .0001 level with an F value of 6.74. Therefore, null hypothesis number four is rejected, indicating that there were statistically significant differences among parish groups on the change in Nutrition Practices between pretest and posttest.

In order to determine where the differences occurred, the Scheffé procedure was used with a confidence interval set at 0.95. In Nutrition Practices, there was a significant difference between Group 9 and six other groups, Groups 2, 3, 5, 6, 7 and 8; there was not a significant difference between Group 9 and Groups 1 and 4. In each comparison with Group 9, the computed difference between groups indicated that Group 9 had a higher positive level of change. Groups 1 and 4 did not differ significantly from any other groups.

Null hypothesis number five states that there will be no significant differences among the changes in Nutrition Attitudes of the nine parish groups of youth participants. An analysis of variance to test for significance of differences among groups on Nutrition Attitudes change showed that the differences were statistically significant at the .0001 level with an F value of 7.23. Therefore, null hypothesis number five is rejected, indicating that there were statistically significant differences among parish groups on the change in Nutrition Attitudes from pretest to posttest.

Since there were significant differences among groups on Nutrition Attitudes change, the Scheffé procedure was used to discover where differences occurred. Five groups, Groups 4, 5, 7, 8 and 9 differed significantly from Group 3, with Group 3 showing a less positive change in attitudes. Group 9 also differed significantly from Group 2, Group 9 showing a more positive change.

Null hypothesis number six states that there will be no significant differences among the changes in 24-hour food consumption of the nine parish groups of youth participants. An analysis of variance was performed to test for significance of differences among groups on 24-hour food consumption. The differences were statistically significant at the .0001 level with an F value of 13.98.

Therefore, null hypothesis number six is rejected, indicating that there were statistically significant differences among parish groups on the change in 24-hour food consumption between pretest and posttest.

In order to determine where significant differences among groups on food consumption occurred, the Scheffé procedure was used. Group 9 differed significantly from all groups except Group 6, with Group 9 showing a higher level of positive change. Group 1 also differed significantly from all other groups, Group 1 showing a more negative change.

Some of these findings appear to offer mixed results. However, in examining findings on parish groups for each of the three youth measures, one group, Group 9, consistently had a more positive change in behavior. Group 9 was also significantly different from other groups in the study for each measure. This indicates that Group 9 benefited more from the nutrition education program than other groups. In an effort to determine a possible reason for this finding, data collected from the classroom teachers and Home Economists were examined. Several reasons may be offered based on these data and on theoretical propositions. a) The Extension Home Economist for Group 9 had the most years of tenure. b) The Extension Home Economist and classroom teacher for Group 9 reported the most number of contacts between each other

during the program period. c) The Extension Home Economist for Group 9 was the only Home Economist coordinator with a full assignment to adult work. This could indicate that she may have had more time to spend with the program, since adult Extension workers generally have a less structured work schedule than youth workers. d) Classroom teachers in Group 9 reported a higher level of parental involvement than most other teachers. e) Classroom teachers reported that all 30 lessons in the program were used. Although the regression analysis reported in the next chapter does not identify some of the factors listed above as significant predictors of student behavior change, it could be that a combination of the factors made the difference.

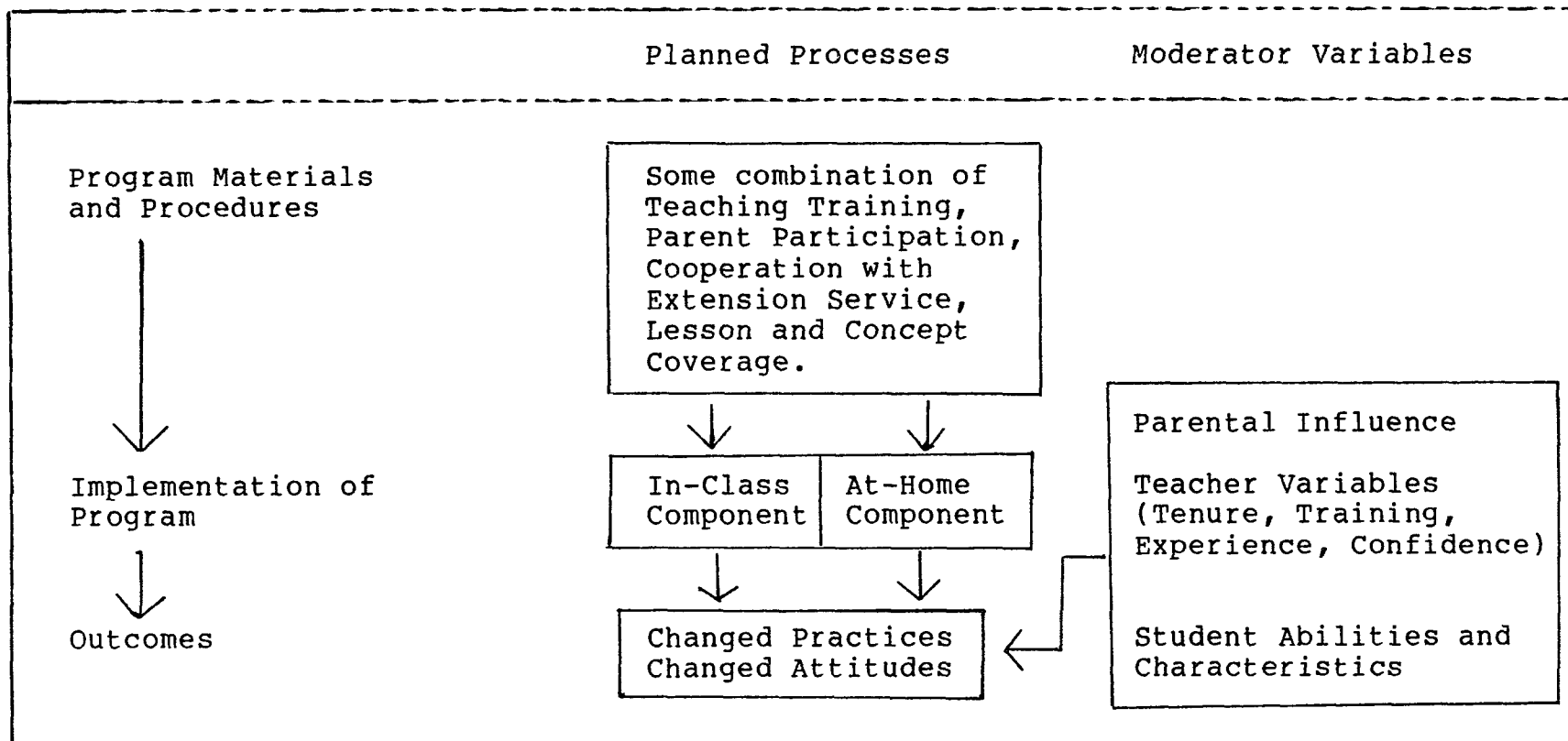
Student variables such as socioeconomic level and intelligence may also have had an influence on behavior change, but study of these factors was beyond the scope of this report. Further studies are being contemplated which may elucidate reasons for differences that exist.

CHAPTER V
ANALYSIS OF VARIABLES AFFECTING
CHANGES IN YOUTH BEHAVIOR

One of the purposes of the study on the Fitness Factor program implementation was to identify program management and teacher variables that might affect the successful outcome of the program. Identification of the variables and their influence on the outcome might be helpful in making recommendations to other Extension personnel who wish to implement the program in the future.

Figure 2 presents an organizing framework for implementation of the nutrition program and identifies variables suspected to moderate or influence certain student outcomes. Included in a planned processes component are variables related to implementation including teacher training, parent participation and involvement, cooperative efforts between Extension and school personnel, and coverage of lessons and concepts in the program. These factors could influence student outcomes through both the in-class and at-home components of the program. At-home components would include homework assignments and some parent involvement activities. Other moderator variables include social factors such as family or parental influence and teacher variables including tenure, experience

Figure 2. Framework of Nutrition Program Implementation, Moderator Variables and Outcomes.



with nutrition, prior training and confidence level. Student abilities and characteristics are shown as possible moderator variables; however, study of these variables is beyond the scope of this report.

A multiple regression analysis was done in order to determine if any of the selected variables might be significant predictors of student behavioral change. The variables selected for inclusion in the analysis were chosen based on theoretical assumptions of the researcher gained through the review of literature, the initial pilot effort of the program and the prestudy Home Economist questionnaire. The teacher questionnaire was designed to gain information on the selected variables.

Null hypothesis number seven states that the changes in Nutrition Practices of youth cannot be predicted by teacher or program management variables. Table 10 shows the results of a regression analysis of selected variables on the Nutrition Practices of youth. The analysis was done on the class level using Nutrition Practices differences between pretest and posttest means as the dependent variable and the selected program management and teacher variables as the independent or predictor variables. An R^2 value of .466 indicates that 46.6 percent of the variance of the changes in Nutrition Practices of youth was accounted for by the 13 selected variables. Two variables are significant at the .05 level, the number of

Table 10. Prediction of Change in Nutrition Practices of Youth by Selected Variables.

Predictor	Regression Coefficient b	Standard Error of Estimate	P
Parents very much involved	0.01	.024	.73
Parents fairly involved	-0.03	.021	.18
Parents not involved	-0.02	.020	.28
Number parent activities used	-0.15	.59	.80
Number lessons used	0.01	.05	.87
Number units adequately covered	0.18	.45	.68
Number teacher training methods used	1.24	.54	.03
Confidence level of teachers	-2.85	1.05	.01
Number agent contacts with teacher during program	0.31	.23	.19
Number resource persons used	-0.45	.36	.22
Teacher's years of teaching experience	0.02	.06	.80
Teacher's prior training in nutrition	-1.93	1.03	.26
Teacher's prior experience teaching nutrition	0.20	1.11	.86
$R^2 = .466$			

teacher training methods used and the confidence level of teachers.

A variety of methods were used by the Extension Home Economists in training classroom teachers in use of the Fitness Factor program. The number of different alternatives used by any one Home Economist ranged from one to five. Those alternatives included a) a half-day inservice workshop before the program began, b) short group meetings of teachers before the program (not as extensive as workshops), c) individual conferences with Home Economists before the program, d) conferences with the Home Economist during the program, and e) no training--self-study of materials by the teacher. Teachers were asked to check those methods by which they received instructions. A total number of methods was obtained by adding the methods checked by each teacher. The number of teacher training methods used has a regression coefficient of 1.24 and is statistically significant at the .03 level. This indicates that the use of a variety of teacher training methods by the Extension agent will improve the outcome of the program effort. If one considers the fact that individuals learn differently, and more exposures will increase learning; this finding makes intuitive sense.

The second significant predictor variable of Nutrition Practices changes was the confidence level of

teachers. Teachers were asked to indicate if they felt a) very confident, b) somewhat confident or c) not too confident in use of the program. The negative regression coefficient of -2.85 ($p < .01$) indicates that students of teachers who were less confident had greater Nutrition Practices change. It could be that teachers who were less confident spent more time and effort in preparation and teaching due to their lack of confidence, while those who were more confident did not. Chetnik (1974) has proposed that the way a teacher views his/her ability to teach the subject influences the teaching. Due to the identification of two significant predictor variables, null hypothesis number seven is rejected indicating that program management variables can predict the student Nutrition Practices change.

Since the total number of teacher training methods was a significant predictor, an analysis of variance was done to determine which of five methods used were the most effective. Table 11 shows that two methods were most effective, short group meetings with teachers before the program and individual conferences before the program with teachers. Short group meetings had an F value of 5.16 and is significant at the .03 level. Individual conferences before the program had an F value of 4.18 and is significant at the .05 level. Therefore, the method of teacher training used can ultimately affect student

Table 11. Effect of Teacher Training Methods on Nutrition Practices of Youth.

Training Method	F value	P
Half-day inservice workshop	0.65	.43
Short group meetings	5.16	.03
Individual conferences before program	4.18	.05
Conferences during program	0.04	.84
No training--self-study	0.81	.37

practice change, probably by increasing the enthusiasm and competence of teachers in use of the program. Little reference to previous research can be made at this point since studies relating to the effects on instruction for teachers do not agree on method of instruction. Perhaps this explains why a variety of teacher training methods was a significant predictor variable. It also should be noted that in many cases the method of instruction used will depend almost entirely on school administration's preference. This may indicate that Home Economists wishing to use the program in the future should use a variety of methods, if possible, preferably including both group meetings and individual conferences when possible. Only three Home Economists were able to secure school time for inservice training for teachers. The barriers to obtaining school time for inservice training, as experienced by most Home Economists in the study, may dictate that other training methods be explored.

Null hypothesis number eight states that the change in Nutrition Attitudes of youth cannot be predicted by teacher or program management variables. To test this hypothesis, a regression analysis was done using the change in Nutrition Attitudes at the class level as the dependent variable and the same selected teacher and program management variables as the predictor variables. Table 12 presents findings of the regression analysis. An

Table 12. Prediction of Change in Nutrition Attitudes of Youth by Selected Variables.

Predictor	Regression Coefficient b	Standard Error of Estimate	P
Parents very much involved	0.03	.01	.03
Parents fairly involved	0.01	.01	.39
Parents not involved	0.02	.01	.13
Number parent activities used	0.08	.34	.82
Number lessons used	0.00	.03	.89
Number units adequately covered	0.06	.24	.81
Number teacher training methods used	0.15	.31	.63
Confidence level of teachers	-1.18	.58	.05
Number agent contacts with teacher during program	0.12	.13	.34
Number resource persons used	0.10	.20	.64
Teacher's years of teaching experience	-0.00	.04	.91
Teacher's prior training in nutrition	-0.03	.56	.96
Teacher's prior experience teaching nutriton	0.88	.65	.19
$R^2 = .393$			

R^2 of .393 indicates that 39.3 percent of the variance was accounted for by the 13 selected predictors. Two predictors were statistically significant at the .05 level. "Parents very much involved" was significant with a regression coefficient of .03 at the .03 significance level. This indicates that a high level of parental involvement will influence greater change in the Nutrition Attitudes of youth than less or no involvement. Other levels of parental involvement, "parents fairly involved" and "parents not involved," were not significant predictor variables. Again the confidence level of teachers was a significant predictor with a negative coefficient of -1.18 at the .05 significance level. Due to these findings, null hypothesis number eight is rejected, indicating that program management variables can predict student Nutrition Attitude change.

Limited statistical analysis using predictor variables was possible using data from the Home Economist questionnaire due to the small number involved (nine). Most of the information collected was used to interpret and supplement other findings and to offer recommendations. However, one item from the questionnaire was used in an analysis with student change in Nutrition Practices and Attitudes.

Null hypothesis number nine states that changes in Nutrition Practices of youth will not be affected by the

Extension Home Economist's frequent participation in the classroom. Null hypothesis number ten states that changes in Nutrition Attitudes of youth will not be affected by the Extension Home Economist's frequent participation in the classroom. To collect data to test these hypotheses, the Home Economists were asked to indicate if they performed teaching functions in the classroom (yes or no). Several of the lessons were designed to utilize resource persons other than the classroom teacher in order to promote interagency cooperation. Using changes in student group means at the Extension Home Economist level, differences between those youth whose Home Economist performed teaching duties and those whose Home Economist did not were tested using an analysis of variance. It was theorized that the Home Economist's presence in the classroom might serve as a motivational tool for both teachers and youth and a measure of support and cooperation between agencies.

Table 13 presents the results of an analysis of variance performed to determine the effect of the Extension Home Economist's frequent participation in the classroom on Nutrition Practices and Nutrition Attitudes of youth. There was a positive change in Nutrition Practices of the youth whose Home Economist performed frequent teaching duties, with a mean Practice change of 2.28 on a scale of 51 points. For the group whose Home Economist did not

Table 13. Effect of the Extension Home Economist's Frequent Participation in the Classroom on Nutrition Practices and Nutrition Attitudes of Youth.

Measure of Behavior Change	Differences in Means Between Pretest and Posttest	F value	Sign Level
Nutrition Practices (a)			
Frequent Agent Participation	2.28	8.48	.02
Non-Participation	-0.28		
Nutrition Attitudes(b)			
Frequent Agent Participation	0.77	2.07	.19
Non-Participation	-0.13		

(a) Scale of possible points ranged from 0 to 51.

(b) Scale of possible points ranged from 2 to 24.

perform frequent teaching duties, the mean change in Nutrition Practices of youth was -0.28. The difference between the two mean changes was significant at .02 level with an F value of 8.48. Therefore, null hypothesis number nine is rejected, indicating that the Extension Home Economist's frequent participation in classroom teaching duties did affect the change in Nutrition Practices of youth and the effect was not due to chance.

There was also a positive change in the Nutrition Attitudes of youth whose Home Economist performed teaching duties with a mean Attitude change of 0.77 on a scale of 24 points. For the group whose Home Economist did not perform teaching duties, the mean change was -0.13. The difference between the two mean changes was not significant with an F value of 2.07 ($p < .19$). Therefore, null hypothesis number 10 cannot be rejected, indicating that the Home Economist's frequent participation in classroom teaching duties did not significantly affect the change in Nutrition Attitudes of youth, although the change was positive for those youth who had Home Economist participation and negative for those who did not.

These findings seem to indicate that the Home Economist's frequent participation in the classroom can have a positive effect on the program effectiveness. This finding is not surprising when one considers the positive comments made by some of the Extension Home Economists

concerning their role in the classroom. The lessons performed by the Home Economists were primarily food demonstration lessons. Two Home Economists commented that the children and teachers had not previously been exposed to the demonstration way of teaching and thoroughly enjoyed it. This was an important exposure of the school population to an Extension method of teaching. Also contributing to the positive effect could be the fact that children had the opportunity to taste new foods at these lessons. One Home Economist ate lunch with the children on several occasions and commented that the children always seemed to be excited to see her. These findings seem to indicate that active cooperation between the Extension Service and the school personnel will increase the overall effectiveness of the program, and the measure of support shown by the Extension Home Economist is important.

The remaining portion of this chapter will discuss further the program management variables studied in this research and shown in the framework of implementation (Figure 2). Although the variables may or may not be statistically significant predictors of nutrition behavioral change of youth, they are included in the structural context of the program and should be considered in a program planning analysis. As a purpose of this study was to make recommendations for future program use, this discussion seems appropriate.

The Fitness Factor program was designed with parental involvement as an integral aspect of the educational program. Gentry (1982) showed that parental involvement can affect more positive behavioral change of youth in the Fitness Factor program. In this study, classroom teachers were asked to indicate the level of program involvement of the parents of their students. A high level of involvement has been shown to significantly predict student Nutrition Attitudes, but not Nutrition Practices. In general, the level of parental involvement reported by teachers was low. Only seven of 45 teachers responding to the question indicated that more than 50 percent of their students' parents were "very involved," while 38 teachers reported that 50 percent or less of their parents were "very involved." Many teachers indicated that it was difficult to get parents involved. This finding agrees with other reported research. Some teachers thought the parent newsletters were too difficult for the reading level of parents and needed to be simplified. One teacher suggested including activities in the curriculum that brought parents into the classroom.

In schools where parental involvement was generated, comments regarding the involvement was favorable. Two teachers involved parents in doing classroom demonstrations; two others involved parents in the lesson on creating commercials. One Extension agent reported active

involvement of parents in making costumes and directing rehearsals for the commercials. She also reported active involvement in growing bean sprouts for the stir-fry vegetable lesson.

Several parent activities were used by teachers, including parent newsletters, a school lunch for parents, and the family workbook. Only one parish group held a family Food and Fitness Fair. The total number of different parent activities used was not shown to be a significant predictor in the regression analysis. This possibly indicates that parental activities for the program need to be redesigned to elicit more active participation as suggested by several teachers.

The number of agent (Home Economist) contacts with the teachers was theorized to be an important program management variable. Although this variable was not a significant predictor, the two teachers (Group 9) who reported the most contacts with the Home Economist during the program were the two teachers whose students had the greatest positive behavioral change. The Home Economist working with these teachers also performed more teaching duties in the classroom than other Home Economists. The frequency of Home Economist participation in the classroom has been shown to be significant in affecting student change. This leads one to believe that frequent contact and active cooperation between the Home Economist and

teacher may be an important factor in success of the program.

The Fitness Factor program was designed to be an interagency program. Much has been written about the lack of efficiency of nutrition education programs due to duplication of efforts across agencies and organizations. Although no quantified measure of interagency cooperation was attempted, all nine Extension Home Economist coordinators report having made contact with school administration and School Food Service personnel during the program period. Eight Home Economists reported that School Food Service personnel assisted with the lesson on school lunch and/or helped arrange the school lunch for parents. Other resource persons listed included the school nurse, physical fitness instructors, home economics teachers, newspaper representatives, 4-H junior leaders, Extension EFNEP aides, Extension homemakers and a local dentist. When asked to indicate which school contact was most advantageous in obtaining approval to implement the program, four Home Economists listed the school system superintendent, three listed the principal, two listed specific curriculum supervisors and one listed the parish School Food Service superintendent. This indicates that each situation is different and no particular approach works best in all situations.

Teacher characteristics that were expected to influence the outcome were tenure, teacher's prior experience with nutrition education and teacher's prior training in nutrition. None of these were significant predictors. However, teacher training methods were shown to be a significant predictor. It appears that a well-developed training program for teachers on the Fitness Factor program itself may be adequate.

The importance of the teacher's attitude was mentioned by several of the Extension Home Economists as perhaps the most influential intervening factor. This indicates a need to properly select, orient and obtain enthusiastic commitment of teachers for most successful use of the program. Perhaps the best strategy may be a well-developed curriculum guide and sales technique for promoting the program, as suggested by Callahan (1973).

CHAPTER VI

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of the study was to evaluate the effectiveness of the Fitness Factor program of the Louisiana Cooperative Extension Service in changing the food and fitness behavior of 1248 fifth grade students taught by 49 teachers in 20 selected schools in nine (9) parishes. A secondary purpose was to identify factors relating to program management that may affect success of the program so that recommendations may be made for future program operations. The study could be described as a program planning analysis providing a summary of empirical results and project implications for future program implementation.

The three sources of data used were (1) responses of youth to a pretest/posttest Nutrition Practices and Attitudes Questionnaire and 24-Hour Food Intake Record; (2) responses of classroom teachers to a Program Evaluation Questionnaire administered after the program and (3) responses of parish Extension Home Economists to a Program Evaluation Questionnaire. Composite scoring systems were developed for each of the sections of the youth questionnaire to test for differences between pretest and posttest means. This testing served as an effectiveness measure for the program. A framework of

program implementation was developed to identify program management and other moderator variables that might affect success of the program. Selected variables were studied using information collected on the classroom teacher and Extension Home Economist questionnaires.

Ten hypotheses were tested using several statistical tests. To test for significant differences between pretest and posttest means of youth on the Nutrition Practices, Nutrition Attitudes and 24-Hour Food Intake, t-tests were used. Differences between pretest and posttest means for the individual Nutrition Practices and Nutrition Attitudes items were also computed and analyzed for significance using t-tests. Analysis of variance and the Scheffé procedure were used to test for differences in behavior change among parish groups of youth participants. Multiple regression was performed to identify significant predictors of Nutrition Practices and Nutrition Attitudes changes of students. Analysis of variance was also used to test differences between groups of youth relating to cooperative efforts between Extension and school personnel.

Summary of Findings

This summary will be organized to include items specified in the framework of program implementation and evaluation developed for this study. Included will be

findings concerning expected outcomes, effectiveness and modification of program materials and processes and influence of moderator variables on program outcome.

Outcomes

Expected outcomes for the program were changed practices, changed attitudes and changed dietary intake of youth participants. Data collected with the youth questionnaire contributed to these findings.

1. Implementation of the Fitness Factor program did significantly affect the frequency of selected food and fitness practices of youth participants. There was a statistically significant difference between pretest and posttest composite means on the Nutrition Practices section of the youth questionnaire at the .0004 level ($t = 3.54$). The change was in a desired positive direction.
2. Implementation of the Fitness Factor program did not significantly affect the overall attitudes of youth toward factors affecting their food choice. Although there was a positive difference between pretest and posttest composite means on the Nutrition Attitudes section of the youth questionnaire, the difference was not statistically significant with a t value of 1.34 ($p < .18$).
3. Implementation of the Fitness Factor program did not affect a positive change in the actual dietary

behavior of youth as measured by a 24-Hour Food Intake Record. There was a negative change that was statistically significant at the .0001 level with a t value of -5.52.

4. The analysis of differences in youth's behavior changes among the nine parish groups showed statistically significant differences among groups at the .0001 level for each of three youth measures, Nutrition Practices, Nutrition Attitudes and 24-Hour Food Intake. Examination of group differences showed that one group had higher positive behavior change than the other groups on all three measures. This group also differed significantly from most other groups on the three measures. Although statistical testing for why this group benefited more from the program effort is beyond the scope of this report, it is suggested that a combination of factors may have contributed to the difference. Factors suspected to be of influence include Home Economist experience and job assignment, parental involvement level, coverage of project material, cooperation between Extension and school personnel and student factors such as intelligence and socioeconomic level. Further studies to elucidate the true reasons for differences are being considered.

These findings agree with those of Shapiro et al. (1974) and St. Pierre and Rezmovic (1982) in that, in

general, nutrition education programs have been shown to generate some, but only minimal, changes in behavior, possibly due to the short-term nature of nutrition education programs and lack of control of outside factors. The lack of positive change in actual dietary intake is suspected to be due to factors such as parental influence and food availability, especially since in many cases the school lunch was the only balanced meal of the day for children. Baker (1972), Yperman and Veermeersch (1979) and Birch (1980) have also alluded to the importance of parental influence and food availability factors at home on the actual dietary behavior of youth. These findings indicate the need to put stronger emphasis on the parent education component of the nutrition program.

The fact that one of the nine parish groups in the study benefited more than other groups seems to indicate that program effectiveness may vary depending on the set of program management conditions, and possibly the audience characteristics. Further research is needed to elucidate true reasons for the differences among groups.

Program Materials and Processes

Following are findings relating to the educational program materials and processes of implementation. Data collected with the student and classroom teacher questionnaires contributed to these findings.

1. Analysis of the 17 individual Nutrition Practices items of the youth questionnaire showed positive statistically significant differences between pretest and posttest for seven of the items. This may indicate strengths of the educational program in the concepts relating to the items. These concepts are the influence of advertising on food choices; the concept of nutrient density, specifically as it relates to empty-calorie foods; the concept of energy needs and energy balance; and the pervasive emphasis throughout the program on trying new foods. The one Practice item that had a negative statistically significant difference related to children helping make food selections at the grocery. This practice may be controlled more by parental influence than youth's choice.
2. Analysis of eight Nutrition Attitudes items of the youth questionnaire showed positive statistically significant differences for five of the items. These five items related to four program concepts of a) the influence of friends on food choice, b) energy needs and energy balance, c) effect of foods on dental health and d) influence of emotional feelings on food choice. This may indicate strengths in the educational program in these concept areas. Food cost and time required to prepare or eat foods were ideas

related to items with negative statistically significant differences.

Cooper and Go (1976) identified characteristics of instructional materials that influence learner success. These included concepts related to current nutrition concerns and learning experiences offering students the opportunity to practice behavior. Poolton (1972) stressed the importance of activities that promote problem-solving and choice-making by students, and those that promote a sense of discovery learning. The entire Fitness Factor curriculum was designed to be activity- and choices-oriented. However, program concepts that appeared to be more effective included those that were more contemporary in nature such as the effects of TV advertising and peers on food choice and the concept of nutrient density and empty-calorie foods. Those concepts offering opportunity for problem-solving, such as energy balance, also appeared to be more effective. These findings seem to indicate that nutrition education programs for youth should be contemporary and socially relevant in nature and should offer opportunity for discovery learning and problem-solving.

3. Teachers were asked to report the level of parental involvement generated by the program effort. In general, the level reported was low with only seven of 45 teachers indicating 50 percent or more of the parents of their students were "very involved." The

teachers reported difficulty in getting parents involved in special parent involvement activities.

Head (1974) also reported lack of success in getting parents to attend program activities and to reinforce program concepts at home. However, researchers who were able to elicit parent involvement did report improvement in children's eating behavior as a result of a program effort (Gentry, 1982 ; Kirks, Hendricks and Wyse, 1982). It is possible that parent education activities in the Fitness Factor program need to be redesigned to elicit more active participation of parents in the classroom. This suggestion was offered by several teachers participating in the study.

4. Several teachers reported lack of adequate time to conduct lesson activities as a problem with the program.

The Effect of Program Management and Moderator Variables

Data were collected and analyzed for a number of variables related to program management. These variables were expected to have an influence on the program outcomes.

Thirteen moderator or predictor variables were selected for inclusion in a regression analysis on student Nutrition Practices change and Nutrition Attitudes change. The variables were selected based on information gained

from the review of literature, the initial pilot effort of the program and the researcher's theoretical base for the study. The variables selected related to teacher training methods, parental involvement, lesson and concept coverage, cooperative efforts between school and Extension personnel, and selected teacher characteristics.

1. The thirteen variables accounted for 46.6 percent of the variance in student Nutrition Practices change between pretest and posttest. Two variables were statistically significant predictors of the change in Nutrition Practices. The two variables were number of different types of teacher training methods used and confidence level of the teacher. The number of teacher training methods had a positive regression coefficient of 1.24 significant at the .03 level, indicating that use of a variety of teacher training methods contributed to program effectiveness. Further analysis revealed the most significant teacher training methods were short group meetings with teachers before the program ($F = 5.16, p < .03$) and individual conferences before the program ($F = 4.18, P < .05$). The second significant variable, confidence level of teachers had a regression coefficient of -2.85 significant at the .01 level, indicating that students of teachers who felt less confident had a higher positive level of change. It is possible that teachers who

felt less confident spent more time and effort in preparation.

2. Thirteen variables accounted for 39.3 percent of the variance in student Nutrition Attitudes change between pretest and posttest. Two variables were significant predictors of change in Nutrition Attitudes. A high level of parental involvement was significant at the .03 level with a regression coefficient of .03, and confidence level of teachers was negatively related to student change with a regression coefficient of -1.18 significant at the .05 level.

These findings seem to indicate that the training of teachers to teach the nutrition program and the attitude of teachers toward the program are of prime importance in influencing outcomes of the program. Previous research has failed to show consistent findings on teacher training methods. Similarly, this research seems to indicate that a variety of teacher training methods should be employed, including both individual and group methods. Maretzki (1979) emphasized that the way teachers are taught will influence their attitude toward the subject and how they will teach it. Chetnik (1974) reported that the way a teacher views his or her ability to teach the subject is important. Callahan (1973) emphasized the importance of sales technique in promoting interest and commitment towards nutrition, and of the use of action-oriented

workshops. These findings all point to the importance of teacher training that focuses on course content, uses a variety of techniques, is exciting and action-oriented and promotes enthusiasm and commitment of teachers. Also reported by Cooper and Go (1976) is the importance of a clearly presented teaching guide as an integral part of the educational curriculum.

Cooperative Efforts Between Organizations

Few references are made in the literature to studies conducted in the area of cooperation and coordination between agencies. However, interagency cooperation seems to be increasingly important as agency budgets are tightening ("Extension in the 80's," 1983). In fact, a lack of coordination between agencies and schools has been reported as a limiting factor in nutrition education efforts ("American Dietetic Association," 1983). Cortes and Standal (1973) previously emphasized the importance of continuing communication between teachers and nutrition professionals when discussing teacher training. Therefore, one important finding of this study may be its positive evidence of cooperation and coordination efforts. Following are findings relating to cooperation efforts between the two primary agencies involved in the program effort.

1. One measure of cooperation between Extension and school personnel was the Extension Home Economist's

participation in the classroom. The Home Economist's frequent participation in classroom teaching duties did have a positive effect on both the student change in Nutrition Practices and Nutrition Attitudes. The effect for Nutrition Attitudes change was statistically significant at the .02 level with an F value of 8.48. The effect for Nutrition Practices change was positive, but not statistically significant with an F value of 2.07 ($p < .19$).

2. Responses to unquantified questions on the teacher and agent questionnaires reveal overall positive reaction from Extension personnel and school officials concerning the program. Forty-two of 45 teachers, 93 percent, said they would recommend the program to other teachers and all Home Economists said they would recommend the program to other Extension agents. Several agents did recommend that a team of Extension agents be responsible for the program due to the time required to conduct the program.
3. Successful use of the Fitness Factor program in a cooperative effort between Cooperative Extension and the school system can offer many potential benefits for Extension. Among those listed by Home Economist participants were a) an improved relationship with the school system and school personnel, b) an awareness of the need for nutrition education in the parish,

c) improved visibility of the Extension agent, d) credibility for the 4-H program, e) an opportunity to interact with unfamiliar school personnel, f) an important exposure of fifth graders to the 4-H way of learning-by-doing, g) a way to involve more minorities, h) recruitment of 4-H leaders and nutrition project leaders, and i) increased 4-H enrollment as student participants qualify for the 4-H school enrichment category.

Conclusions

Following are the conclusions offered based on findings of the study.

1. Implementation of the Fitness Factor program can affect a positive change in food and fitness practices and attitudes of youth. The behavior change in this study was brought about in a diverse group of youth under a diverse group of teaching situations. This coupled with overall positive reaction from both school and Extension personnel indicates that the program can have some level of effectiveness under a variety of circumstances.
2. Changes in actual dietary intake of youth may be more difficult to bring about due to moderating factors such as parental influence and food availability at home and at school. The importance of the school lunch as a balanced meal for children should be

emphasized. Also strongly indicated is the need to involve food providers (parents) of youth in the educational program.

3. Although the program implementation did bring about some positive effects across nine diverse parish situations, one parish group appeared to benefit more from the program as shown by statistically significant differences between that group and others in the study. It is possible that the program may elicit better response with certain types of students and teachers and under a specific set of program management operations. The set of interacting variables suspected to be of influence relate to Extension Home Economist experience and job assignment, adequate coverage of lessons and concepts by teachers, parental involvement, and cooperation and support efforts between Extension and school personnel. It is also suspected that student abilities and socioeconomic level may have an important influence. Further studies may offer this evidence.
4. Analysis of individual items of Nutrition Practices and Attitudes implied strengths in the educational program relating to concepts of energy needs and energy balance, influence of factors such as advertising and friends on food choice, nutrient density as it relates to empty-calorie foods, and trying new foods.

These concepts might be considered "contemporary" in nutrition education as opposed to traditional concepts such as the food groups and a balanced diet. Lack of positive response to the more traditional nutrition concepts could indicate that youth respond better to a more contemporary approach to food and fitness education and that traditional concepts need to be redefined in a more exciting and contemporary fashion.

5. Parental involvement has been shown to be an important component in a nutrition education program for youth, but active parental involvement has been reported difficult to elicit. Parental involvement activities may need to be redesigned to elicit more cooperation from parents.
6. The Fitness Factor program can be successfully implemented in a school setting by the Cooperative Extension Service. In an implementation effort, several factors need to be considered as important determinants of program success.
 - a. Approval and support of school administration should be secured before program implementation.
 - b. Selection of teachers should be made on the knowledge that enthusiasm and positive attitude of the teacher appears to be an important factor in program success. No prior experience with nutrition education on part of teachers is mandatory.

- c. Teacher training should be designed to include a variety of methods including both group and individual meetings. Content of the training should focus on program content and methods and should incorporate sales technique to obtain enthusiasm and commitment of teachers.
 - d. Instructions for abridging or segmenting the course to adapt to school schedules and time constraints should be included in instructions to teachers.
 - e. Parent involvement activities should be encouraged.
 - f. The Extension agent should plan to cooperate as frequently as possible in classroom teaching duties and should encourage frequent communication with the teachers.
7. Cooperation between Extension and the school system in implementation of a program like the Fitness Factor offers many potential benefits including improved relationships, exposure of new audiences to the Extension and 4-H way of learning, and proof of the caliber of educational program the Extension Service has to offer.

Recommendations

Following are recommendations for future research and program use.

1. Further studies need to be conducted to determine student variables which might affect more positive response to the Fitness Factor program. This will aid in selecting potential audiences, or in adapting program materials to reach all audiences.
2. Methods of parental involvement should be examined and possibly redesigned to meet existing needs and limitations of parent education, including application of concepts, literacy considerations and time constraints. A concentrated effort to elicit parental involvement should be made in future program efforts.
3. The program time period might be extended to allow more time for classroom teachers to adequately cover program concepts. A longer program period will also allow more time for behavioral change to occur. Currently the program is designed for six to nine weeks. The program activities might be spread out and integrated into the curriculum over an entire semester.
4. Every effort should be made to continue evaluation of student behavioral change as a result of the program. This will provide a basis for determining impact in Extension youth programs. Also, Cooper and Go (1976) noted the importance of evaluative procedures for teacher accountability. The food intake record of the youth instrument might be redesigned to cover a three-day period, perhaps giving a more consistent record of

children's diets. The activity might also be incorporated into the program in such a way as to include parental exposure.

5. Extension Home Economists (both youth and adult) should be encouraged to initiate the Fitness Factor program in their parishes in order to capture the potential benefits to the parish Extension Service. Other parish Extension personnel should be encouraged to participate in a team effort with the Home Economist coordinator.
6. The current status of the Extension 4-H program as a co-curricular program supports the introduction of programs like the Fitness Factor to the school curriculum. The program can be implemented in the classroom and at the same time exposes youth to the 4-H way of learning-by-doing. It has curriculum strength in that it is designed to cover student competencies set by the school system. Thus it may serve as a format for future development of 4-H materials.
7. In order to benefit most from findings of this study, Extension personnel should be encouraged to use a systems approach to program planning strategy before attempting use of the Fitness Factor program. Included in the strategy should be identification of appropriate audiences (student and teachers), adequate preparation activities including administrative con-

tact and teacher training, support and cooperation activities during the program period, strategy planning for parental involvement, and program evaluation efforts.

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APPENDIX

YOUTH QUESTIONNAIRE

Name _____

INSTRUCTIONS: Check the answer which most correctly finishes the sentence.

	Usually or Very Often	Fairly Often	Occa- sionally	Seldom or Never
1. I try new foods	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
2. I choose food for meals from the 4 main food groups	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
3. I eat breakfast	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
4. I eat 10 or more different kinds of foods each day	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
5. I try different kinds of diets to lose weight	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>
6. I choose snack foods from the 4 main food groups	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
7. I ask for cereals and snacks I see advertised on TV	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>
8. After school I play or work out- side instead of watching TV	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
9. I help prepare meals	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
10. I help make food selections at the grocery store	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
11. I exercise hard for 15-30 minutes at least 3 times a week	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
12. I read food labels for the list of ingredients	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
13. I eat candy or packaged sweets	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>
14. I brush or rinse my teeth after eating sweet foods	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
15. I try to balance the energy of the food I eat with energy I use in daily activities	<u>3</u>	<u>2</u>	<u>1</u>	<u>0</u>
16. I eat chips or pretzels	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>
17. I take vitamins	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>

YOUTH QUESTIONNAIRE

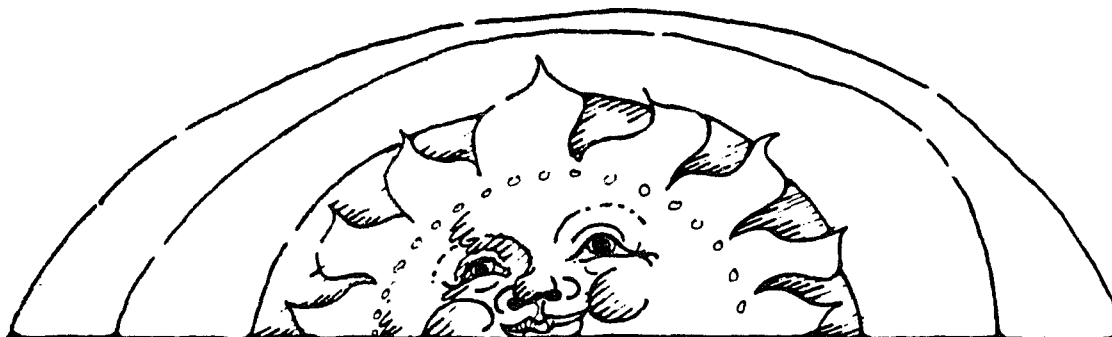
Name _____

When you are choosing foods, how important to you is:

	Very Important	Fairly Important	Not Important
1. The taste?	<u>1</u>	<u>1</u>	<u>1</u>
2. What friends are choosing?	<u>0</u>	<u>1</u>	<u>2</u>
3. The nutritive value?	<u>5</u>	<u>3</u>	<u>0</u>
4. Your energy needs?	<u>3</u>	<u>2</u>	<u>0</u>
5. The cost?	<u>2</u>	<u>1</u>	<u>0</u>
6. The time it takes to prepare or eat?	<u>2</u>	<u>1</u>	<u>0</u>
7. What parents usually choose?	<u>1</u>	<u>1</u>	<u>1</u>
8. The effect on your weight?	<u>3</u>	<u>2</u>	<u>0</u>
9. The effect on your teeth?	<u>3</u>	<u>2</u>	<u>0</u>
10. How happy or unhappy you're feeling?	<u>0</u>	<u>1</u>	<u>2</u>

YOUTH QUESTIONNAIRE

Name _____



Write down everything you had to eat **AND DRINK** for the last 24 hours. Begin with your most recent snack or meal and think backward. Be sure to write **HOW MANY** and **WHAT SIZE** servings you had.

Example: 1 **SMALL GLASS** orange juice

Breakfast	Afternoon Snacks
Morning Snacks	Evening Meal
Lunch	Evening Snacks

THE FITNESS FACTOR PROGRAM EVALUATION
Classroom Teacher Questionnaire

You recently used a food and fitness curriculum called the Fitness Factor to teach students in your class. The Louisiana Cooperative Extension Service, who developed this curriculum, would like to make this program as effective and useful as possible.

We need your help. Your response to the following questions can help us improve the program for use by other teachers throughout the state. Please answer the following questions and return the completed questionnaire in the self-addressed stamped envelope. Your responses are appreciated.

1. How effective would you say the Fitness Factor Program was in creating an awareness of the need for good food and fitness habits among your students?

Very effective	<input type="checkbox"/>
Fairly effective	<input type="checkbox"/>
Not effective	<input type="checkbox"/>

2. How effective would you say the Fitness Factor Program was in getting your students to practice good food and fitness habits?

Very effective	<input type="checkbox"/>
Fairly effective	<input type="checkbox"/>
Not effective	<input type="checkbox"/>

3. How much improvement have you noticed in the eating habits of your students since the beginning of the program (from observation at school lunch or otherwise)?

Much improvement	<input type="checkbox"/>
Some improvement	<input type="checkbox"/>
No noticeable improvement	<input type="checkbox"/>

4. How would you rate the effectiveness of each of the following parts of the program?
 - a. Classroom curriculum

Very effective	<input type="checkbox"/>
Fairly effective	<input type="checkbox"/>
Not effective	<input type="checkbox"/>

 - b. Parent involvement activities

Very effective	<input type="checkbox"/>
Fairly effective	<input type="checkbox"/>
Not effective	<input type="checkbox"/>

- | | |
|---|--|
| c. Use of 4-H manual "Fit It All Together" | Very effective <input type="text"/>
Fairly effective <input type="text"/>
Not effective <input type="text"/> |
| d. Cooperative efforts with the Louisiana Cooperative Extension Service (including the classroom demonstrations by the Extension agent) | Very effective <input type="text"/>
Fairly effective <input type="text"/>
Not effective <input type="text"/> |

If you said "not effective" for any part of question number four (4), why did you think the part was not effective? _____

5. What percent of the parents of your students would you say were very much involved in this program? what percent fairly involved? and what percent not involved? (Put a percent in the appropriate boxes; all three boxes should total 100%.)

	Percent
Very much involved	<input type="text"/>
Fairly involved	<input type="text"/>
Not involved	<input type="text"/>
	100

6. How effective were each of the following parent activities in getting parents involved with the program?

- | | |
|---|--|
| a. Newsletter | Very effective <input type="text"/>
Fairly effective <input type="text"/>
Not effective <input type="text"/>
Did not use <input type="text"/> |
| b. Family workbook ("Fit It All Together" manual) | Very effective <input type="text"/>
Fairly effective <input type="text"/>
Not effective <input type="text"/>
Did not use <input type="text"/> |
| c. School lunch for parents | Very effective <input type="text"/>
Fairly effective <input type="text"/>
Not effective <input type="text"/>
Did not use <input type="text"/> |

d. Food and fitness family fair

Very effective	<input type="checkbox"/>
Fairly effective	<input type="checkbox"/>
Not effective	<input type="checkbox"/>
Did not use	<input type="checkbox"/>

e. Other (please list)

Very effective	<input type="checkbox"/>
Fairly effective	<input type="checkbox"/>
Not effective	<input type="checkbox"/>
Did not use	<input type="checkbox"/>

7. Did you keep some kind of record of how much parents got involved at home?

Yes ☐
No ☐

If yes, how did you keep a record? _____

8. How many of the 30 lessons in the curriculum were you able to use? / /

Please list any you did not use and tell why you didn't use them. _____

9. How useful to you were the student evaluations at the end of each unit?

Useful and adequate for grading purposes	<input type="checkbox"/>
Useful but not adequate for grading purposes	<input type="checkbox"/>
Not useful	<input type="checkbox"/>

If you checked "not useful," why? _____

10. To what extent were you able to cover the objectives for each of the units?

Unit	I Finding the Puzzle Pieces	
	Very adequate coverage	<input type="checkbox"/>
	Adequate coverage	<input type="checkbox"/>
	Minimal coverage	<input type="checkbox"/>
	Did not cover	<input type="checkbox"/>

Unit II Matching Up the Parts

Very adequate coverage
 Adequate coverage
 Minimal coverage
 Did not cover

☐
☐
☐
☐

Unit III Shaping Up the Outline

Very adequate coverage
 Adequate coverage
 Minimal coverage
 Did not cover

☐
☐
☐
☐

Unit IV Filling in the Spaces

Very adequate coverage
 Adequate coverage
 Minimal coverage
 Did not cover

☐
☐
☐
☐

Unit V Looking for the Details

Very adequate coverage
 Adequate coverage
 Minimal coverage
 Did not cover

☐
☐
☐
☐

Unit VI Seeing the Whole Picture

Very adequate coverage
 Adequate coverage
 Minimal coverage
 Did not cover

☐
☐
☐
☐

11. a. Would you omit any of the activities in the program?

Yes
 No

☐
☐

- b. If yes, which ones and why? _____

- c. Are there any other activities not included that you feel should be? _____

12. a. What type of training and instruction did you receive from the Extension agent? Check all that apply.

1/2 day inservice workshop before the program started

☐

Short group meeting of teachers with agent before the program (not as extensive as a workshop)

☐

Individual conference with agent before
the program ☐

Conferences with agent during program ☐

No training--I studied the materials by
myself ☐

Other (list) _____ ☐

- b. How adequate was the training and instruction you
received from the Extension agent?

Very complete, no additional training
needed ☐

Adequate, but could have been more
complete ☐

Not adequate ☐

- c. If you checked "not adequate," why? _____

13. How confident did you feel in use of the program with
your students?

Very confident (Usually was able to follow
instructions and teach activities) ☐

Somewhat confident (Experienced some
difficulty in following instructions and
teaching activities) ☐

Not too confident (Had great difficulty
in following instructions and teaching
activities) ☐

14. About how many times during the program did you
have contact with the Extension agent concerning
the program? Do not include training prior to the
program period or student evaluation sessions. ☐

15. What other school personnel or resource persons did
you involve in the program? and what did they do?
Please list title of person and what they did.

Resource Person (list)

What They Did

16. Would you please indicate any problems you may have had with the Fitness Factor program?
-
-

17. How many years have you been teaching?

18. Have you ever received any training in nutrition?

Yes ☐

No ☐

If yes, please check the types of training you have received.

Formal training (coursework) ☐

Teacher inservice training ☐

Training through other work experience ☐

19. Had you ever taught nutrition or fitness concepts in the classroom before this program

Yes ☐

No ☐

If yes, please indicate how.

Have taught a whole unit in nutrition ☐

Have used nutrition activities in other classes ☐

20. What major subject areas do you teach? Check all that apply.

Science ☐

Health ☐

Physical Education ☐

English ☐

Math ☐

Social Studies ☐

Other (list) ☐

21. How important to you are the following food and fitness practices?

- a. Eating foods from four (4) main food groups

Very important ☐

Fairly important ☐

Of little importance ☐

- b. Eating breakfast

Very important ☐

Fairly important ☐

Of little importance ☐

- c. Choosing foods for snacks from four (4) main food groups
- | | |
|----------------------|--------------------------|
| Very important | <input type="checkbox"/> |
| Fairly important | <input type="checkbox"/> |
| Of little importance | <input type="checkbox"/> |
- d. Exercising regularly
- | | |
|----------------------|--------------------------|
| Very important | <input type="checkbox"/> |
| Fairly important | <input type="checkbox"/> |
| Of little importance | <input type="checkbox"/> |
- e. Reading food labels for ingredients
- | | |
|----------------------|--------------------------|
| Very important | <input type="checkbox"/> |
| Fairly important | <input type="checkbox"/> |
| Of little importance | <input type="checkbox"/> |
- f. Brushing teeth after eating
- | | |
|----------------------|--------------------------|
| Very important | <input type="checkbox"/> |
| Fairly important | <input type="checkbox"/> |
| Of little importance | <input type="checkbox"/> |
- g. Balancing calorie intake with activity
- | | |
|----------------------|--------------------------|
| Very important | <input type="checkbox"/> |
| Fairly important | <input type="checkbox"/> |
| Of little importance | <input type="checkbox"/> |
- h. Controlling amount of fat in diet
- | | |
|----------------------|--------------------------|
| Very important | <input type="checkbox"/> |
| Fairly important | <input type="checkbox"/> |
| Of little importance | <input type="checkbox"/> |
- i. Controlling amount of sugar in diet
- | | |
|----------------------|--------------------------|
| Very important | <input type="checkbox"/> |
| Fairly important | <input type="checkbox"/> |
| Of little importance | <input type="checkbox"/> |
- j. Controlling amount of salt in diet
- | | |
|----------------------|--------------------------|
| Very important | <input type="checkbox"/> |
| Fairly important | <input type="checkbox"/> |
| Of little importance | <input type="checkbox"/> |
- k. Eating high fiber foods such as whole grains and fresh fruits and vegetables
- | | |
|----------------------|--------------------------|
| Very important | <input type="checkbox"/> |
| Fairly important | <input type="checkbox"/> |
| Of little importance | <input type="checkbox"/> |
22. What changes, if any, have you made in your or your family's food and fitness habits as a result of having been involved in teaching this program?
-
-

23. Please give an estimate of the education level of parents of your students involved in the program. Check the appropriate box below.

The majority of parents of your students:

Did not graduate from high school ☐

Graduated from high school, but did not attend college ☐

Attended college ☐

24. Would you plan to use the Fitness Factor Program again?

Yes, the total program ☐

Yes, just the classroom curriculum as a 6 or 9 week unit ☐

Yes, some of the units and lessons ☐

No ☐

25. Do you plan to use the Extension agent as a resource teacher for your class in the future?

Yes, definitely ☐

Yes, possibly ☐

No ☐

26. What benefits or advantages can you see in using the Fitness Factor program? _____

27. Would you use the "Fit It All Together" manual for students if it was necessary for the school system or the students to purchase the manual for 50 cents each?

Yes ☐

No ☐

28. Which of the parent involvement activities would you use in the future? Check all that apply.

Newsletter ☐

Family workbook ☐

School lunch for parents ☐

Food and fitness family fair ☐

Other (list) ☐

29. Would you recommend this curriculum to other teachers?

Highly recommend	<input type="checkbox"/>
Recommend with some reservations	<input type="checkbox"/>
Probably would not recommend	<input type="checkbox"/>

Thank you for your enthusiastic participation in the Fitness Factor pilot program. You have helped us in testing and evaluation of this new program for youth.

Name: _____

Address: _____

THE FITNESS FACTOR PROGRAM HOME ECONOMIST
INTERVIEW SCHEDULE
(Prestudy Questionnaire)

Agent's Name _____ Questionnaire # _____

Parish _____

_____, you are now in the process of introducing the Fitness Factor Program in your parish. Your experience with the program and your suggestions about program management will eventually help other Home Economists in the state with the program. I'd like to ask you some questions about your experience thus far with the program planning phase of the project.

1. What was your primary reason(s) for accepting this project?

2. What are some of the positive benefits you expect from this project?

3. At this point, what do you consider its chances for success?

Very Good	<input type="checkbox"/>
Good	<input type="checkbox"/>
Fair	<input type="checkbox"/>
Poor	<input type="checkbox"/>
Very Poor	<input type="checkbox"/>

4. In relation to this project, what would be your definition of success? (What accomplishments do you feel are necessary in order to call the project a success in your parish. Please list.)

5. What the the goals that you personally want to achieve with this project?

6. At this point, which of the following school personnel have you been in contact with to obtain approval for the program?

School Superintendent	<input type="checkbox"/>
School Food Service Supervisor	<input type="checkbox"/>
Elementary Curriculum Supervisor	<input type="checkbox"/>
Principal(s)	<input type="checkbox"/>
Teachers	<input type="checkbox"/>
Other (list)	<input type="checkbox"/>

7. Which personal contact do you feel was the most advantageous to you in obtaining approval?

School Superintendent	<input type="checkbox"/>
School Food Service Supervisor	<input type="checkbox"/>
Elementary Curriculum Supervisor	<input type="checkbox"/>
Principal(s)	<input type="checkbox"/>
Teachers	<input type="checkbox"/>
Other (list)	<input type="checkbox"/>

8. Prior to this program, how would you rate your working relationship with the following school personnel?

Superintendent	Excellent	<input type="checkbox"/>
	Good	<input type="checkbox"/>
	Fair	<input type="checkbox"/>
	Poor	<input type="checkbox"/>
	No prior contact	<input type="checkbox"/>

School Food Service Supervisor	Excellent	<input type="checkbox"/>
	Good	<input type="checkbox"/>
	Fair	<input type="checkbox"/>
	Poor	<input type="checkbox"/>
	No prior contact	<input type="checkbox"/>

Curriculum or other Supervisors you had
to contact for this project. List other.

Excellent	<input type="checkbox"/>
Good	<input type="checkbox"/>
Fair	<input type="checkbox"/>
Poor	<input type="checkbox"/>
No prior contact	<input type="checkbox"/>

9. What different people and agencies do you expect to cooperate in the project?

Homemaker Club members ☐

Extension leaders ☐

Explain _____

Junior leaders ☐

Public Health ☐

La. Heart Association ☐

Other agencies (list) ☐

Other school personnel (list) ☐

Parents (explain) ☐

Room mothers ☐

Other agents (list) ☐

10. What problems have you encountered at this point that are of concern to you?

11. What approach do you plan to take in conducting the teacher orientation training?

1 day inservice workshop ☐
 1/2 day inservice workshop ☐
 Individual conferences with teachers ☐
 Briefing with teachers only and self-study of materials by teachers ☐

12. Do you plan to supplement the program with other materials, activities, records, etc? Yes ☐
 No ☐

If yes, please explain _____

13. Please give below the following information concerning your project plans. Use additional sheet if necessary.

<u>School</u>	<u>Teacher</u>	<u>Sex of Teacher</u>	<u>Class Period</u>	<u>No. of Students</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

14. Please indicate the dates the program will be taught in the classroom. Give month, day and year.

_____ to _____

Will this be a 6 week or 9 week period?

6 week ☐
 9 week ☐
 Other (specify) ☐

15. Years of service _____.

16. Program Assignment _____.

Thank you.

THE FITNESS FACTOR PROGRAM HOME ECONOMIST
INTERVIEW SCHEDULE
(conducted after pilot program)

Agent's Name _____ Questionnaire # _____

Parish _____

1. On a scale of one to five, how would you rate the overall success of the Fitness Factor program in your parish?

1 2 3 4 5
 Not Successful Very Successful

2. On a scale of one to five, how would you rate the value of the program as an educational program for future use by the Louisiana Cooperative Extension Service?

1 2 3 4 5
 Not Successful Very Successful

3. On a scale of one to five, how would you rate the effectiveness of the program in each of the following areas?

- | | Not
Effective | 1 | 2 | 3 | 4 | 5 | Very
Effective |
|---|------------------|----------|----------|----------|----------|----------|-------------------|
| a. Creating changes (impact) in food and fitness behavior of youth | | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> | |
| b. Creating an awareness of the need for and importance of nutrition education in your parish | | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> | |
| c. Improving visibility and image of Extension | | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> | |
| d. Increasing cooperation with the school system | | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> | |
| e. Increasing awareness of 4-H program | | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> | |
| f. Increasing diet and fitness consciousness of clientele | | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> | |

4. Please list any other benefits gained from the program other than those just listed. On the same one to five scale, how would you rate that benefit?

	Not Effective	1	2	3	4	Very Effective

5. After the program how would you rate your working relationship with the school system and personnel?

School System in General

Excellent	<input type="checkbox"/>
Good	<input type="checkbox"/>
Fair	<input type="checkbox"/>
Poor	<input type="checkbox"/>

School Superintendent

Excellent	<input type="checkbox"/>
Good	<input type="checkbox"/>
Fair	<input type="checkbox"/>
Poor	<input type="checkbox"/>

School Food Service Supervisor

Excellent	<input type="checkbox"/>
Good	<input type="checkbox"/>
Fair	<input type="checkbox"/>
Poor	<input type="checkbox"/>

Elementary Curriculum Supervisor

Excellent	<input type="checkbox"/>
Good	<input type="checkbox"/>
Fair	<input type="checkbox"/>
Poor	<input type="checkbox"/>

Principal(s)

Excellent	<input type="checkbox"/>
Good	<input type="checkbox"/>
Fair	<input type="checkbox"/>
Poor	<input type="checkbox"/>

Teachers

Excellent	<input type="checkbox"/>
Good	<input type="checkbox"/>
Fair	<input type="checkbox"/>
Poor	<input type="checkbox"/>

Other (list)

☐

6. How adequate was the training and instruction you received for use of the program?

Adequate, I felt comfortable with use of the program ☐

Adequate, but I could have used additional training ☐

Not adequate, I felt uncomfortable with the program ☐

If you indicated you needed additional training, where did you feel a deficiency? _____

What additional assistance would an agent need from the State Office? _____

7. On a scale of one to five with five being very important and one being not important, indicate how important you feel it is to include the following parts of the program in a program effort.

	Not Important		Very Important		
	1	2	3	4	5
Training and guidance given to teachers by Extension	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Use of complete curriculum materials by teachers	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Parent involvement activities	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Use of "Fit It All Together" manual	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Classroom demonstrations by Extension agent	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Food and Fitness Fair	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Pre and Posttest evaluation	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>

8. a. What type of training and instruction did you give teachers? Check all that apply.

1/2 day inservice workshop before the program ☐

Short group meeting(s) with teachers (not as extensive as inservice workshop) ☐

Individual conferences with teachers before the program ☐

Conferences during the program
 None, self-study by teachers
 Other _____

☐
☐
☐

- b. Do you feel that the training you provided was adequate for teachers?

Very adequate, no additional training needed
 Adequate, but could have been more complete
 Not adequate

☐
☐
☐

- c. How would you recommend that other agents train teachers?

9. a. Did you do the Stir-Fry Demonstration lesson in the classroom?

Yes
 No

☐
☐

- b. Did you teach any other lessons or perform any other teaching duties?

Yes
 No

☐
☐

- c. If yes, what did you do? _____

10. About how many times during the program period did you have contact with the teachers concerning the program? Do not include training prior to the program period or student evaluation sessions.

☐

11. On a scale of one to five, indicate the level of difficulty you had in conducting the program as compared to other Extension programs.

1 2 3 4 5
 Not Any More Difficult Great Level of Difficulty

12. a. What major problems did you encounter with the program?

(1) _____

(2) _____

(3) _____

b. What ones were you successful in solving?

(1) above ☐

(2) above ☐

(3) above ☐

c. How did you solve them? _____

13. List the people and agencies that cooperated in this project and tell what they did.

Agency or People

What They Did

_____	_____
_____	_____
_____	_____

14. Did you supplement the program with additional materials, activities, records, etc.?

Yes ☐

No ☐

If yes, explain. _____

15. What period of time did the program cover?

6 weeks ☐

9 weeks ☐

Other ☐

(Explain) _____

16. Give the dates for the program. Give month, day, year.

_____ to _____

17. Did you hold the Fair? _____

When? _____

Where? _____

18. Would you consider using the program in your school system in future years? Yes ☐
No ☐

If no, why not? _____

19. Would you recommend the program to other agents?
(Adult and youth agents)

	<u>Adult Agent</u>	<u>Youth Agent</u>
Highly recommend	<input type="checkbox"/>	<input type="checkbox"/>
Recommend with some reservations	<input type="checkbox"/>	<input type="checkbox"/>
Probably would not recommend	<input type="checkbox"/>	<input type="checkbox"/>

20. In general, what suggestions would you have for other agents wanting to use the program?

21. Were there any extenuating circumstances that you felt hindered or contributed to the success of the program?

22. On a scale of one to five, how would you rate your interest in nutrition.

Not Interested					Very Interested
	1	2	3	4	5

(To be filled in by interviewer)

23. Group or single agent effort Group ☐
Single ☐

24. Tenure of agent(s) _____

25. Program Assignment(s) _____

26. Number of family members attending School Lunch _____

27. Number of family members attending Food and Fitness
Fair(s) _____

28.

<u>School</u>	<u>Teacher</u>	<u>Sex of Teacher</u>	<u>Class Period</u>	<u>No. of Students</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

VITA

The author is a native of Bastrop, Louisiana. She was born on August 20, 1952, the daughter of Woodrow and Doris L. Cain. She received her elementary education in Bastrop and graduated co-valedictorian from Bastrop High School in 1970.

In the summer of 1970, she entered Louisiana Tech University. She graduated summa cum laude with a Bachelor of Science degree in Vocational Home Economics Education in May of 1973 from the same institution.

In September, 1973, she entered graduate school at Louisiana Tech University where she received a Master of Science degree in Institutional Management in 1974.

In September of 1974, she was employed by the Louisiana Cooperative Extension Service as Assistant Home Economist in Ouachita Parish. She was promoted to Associate Home Economist in 1977.

In 1976 she completed requirements for dietetic registration with the American Dietetic Association.

On August 6, 1977, she was married to Gary Edwards Gentry of Monroe, Louisiana.

In May, 1979, she accepted the position of Extension Assistant on the state Cooperative Extension staff. Since that time she has served as an Extension Assistant in the

state Home Economics (Nutrition) and Field Operations departments. Currently the author has the position of Extension Associate in the Field Operations office.

After moving to Baton Rouge, graduate studies began again in 1981. After several years of study, she applied and was accepted as a candidate for the degree of Doctor of Education.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Peggy C. Gentry

Major Field: Extension Education

Title of Dissertation: The Elementary Level Food and Fitness Curriculum of the
Louisiana Cooperative Extension Service: Program
Effectiveness and Management

Approved:

Edward W. Gussie
Major Professor and Chairman

William Poye
Dean of the Graduate School

EXAMINING COMMITTEE:

Michael Mangum

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Date of Examination:

November 21, 1985